



Investing in rural people

## Republic of the Sudan

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**PCR, April 2016**

**Project completion report**

Main report and appendices

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## Currency equivalents

Currency Unit	=
US\$1.0	=

## Weights and measures

1 kilogram	=	1000 g
1 000 kg	=	2.204 lb.
1 kilometre (km)	=	0.62 mile
1 metre	=	1.09 yards
1 square metre	=	10.76 square feet
1 acre	=	0.405 hectare
1 hectare	=	2.47 acres

## Abbreviations and acronyms

ARP	Agricultural Revival Programme
AWPB	Annual Work Plan & Budget
BDA	Butana Development Agency
BIRDP	Butana Integrated Rural Development Project
BoD	Board of Directors
DSF	Debt Sustainability Framework
CBOs	Community-based organizations
CCU	Central Coordination Unit
CDC	Community Development Committee
CRF	Community road fund
ENS	Engineered Natural Surface
EIRR	Economic internal rate of return
GDP	Growth Domestic Product
GoS	Government of Sudan
ICB	International Competitive Bidding
ICO	IFAD Country Office
KER	Key Expected Result
M&E	Monitoring & Evaluation
MoA&F	Ministry of Agriculture & Forestry
MPPU	Ministry of Planning and Public Utilities
MTR	Mid-Term Review
NHBA	National Highways and Bridges Authority
NPV	Net Present Value
NPW	Net Present Worth
PMU	Programme Management Unit
PSC	Programme Steering Committee
RAP	Rural Access Project
RIMS	Results and impact management system
SDG	Sudanese Pounds
SOE	Statement of Expenditure
SWC	Soil & Water Conservation
ToT	Training of Trainers
VRC	Village Road Committee



## Project at a glance

<b>Country</b>	Sudan				
<b>Project name</b>	Rural Access Project				
<b>Key dates</b>					
<b>IFAD approval</b>	<b>Signing</b>	<b>Effectiveness</b>	<b>Mid-term review</b>	<b>Original completion</b>	<b>Actual completion</b>
17/12/2009	4/4/2010	4/2010	1-26/9/2012	30/6/2014	31/12/2015
<b>Original loan closing</b>			<b>Actual loan closing</b>	<b>No. of extensions</b>	
31/12/2014			30/6/2016	1	
<b>IFAD financing</b>					
<b>Grant</b>	<b>SDR million</b>	8,200,000	<b>% disbursed</b>	93.16	
<b>Actual costs and financing (US\$'000)</b>					
<b>Component</b>	<b>IFAD</b>	<b>Beneficiaries</b>	<b>Government</b>	<b>Total</b>	
Component 1	10.33	0.09	1.79	12.21	
Component 2	2.22	0	0.12	2.39	
Component 3	0.41	0	0.01	0.42	
Grand total	12.96	0.09	1.92	15.02	
<b>Number of beneficiaries</b>					
<b>Total</b>	<b>Indirect</b>	<b>Direct reached</b>	<b>Women reached</b>	<b>Men reached</b>	<b>Men and women not reached</b>
130 000	55 000	68 801	31 935	36 866	6 199
<b>Project objective</b>					
The main objective of RAP is to improve the socio-economic conditions of 130,000 poor rural people living in the Butana area, or about 15,000 producer households by improving their access to productive services and markets.					
<b>Country partners</b>					
<b>Executing agency</b>	Butana Development Agency (BDA)				
<b>NGOs/civil society</b>	N.A.				
<b>Other</b>	Ministry of Agriculture & Forestry; Ministry of Planning and Public Utilities; National Highways and Bridges Authority				



## Executive Summary<sup>1</sup>

### Introduction

1. The completion review process for the Rural Access Project (RAP) was planned and conducted in line with the new IFAD guidelines and emerging best practices. The project completion review (PCR) was jointly prepared by the relevant Government of Sudan (GoS) counterparts - the Ministry of Finance & Economic Development (International Cooperation Directorate; MoFED) & the Ministry of Agriculture & Forestry (MoA&F) - the Programme Management Unit (PMU), two external consultants and two IFAD staff. The focus was on enhancing country and institutional level benefits, learning and sustainability. The process was an iterative process of consultation and learning. The emerging lessons were shared with the Ministry of Agriculture & Forestry (MoA&F) during a wrap-up meeting, and will be incorporated into the design and implementation of other similar rural development programs in the country.

### Programme Description

2. The Rural Access Project was approved by IFAD Executive Board in December 2009. The project financing plan consists of a DSF grant of US\$12.95 million, a government contribution of US\$1.92 million in the form of customs duties and taxes, and a contribution by beneficiaries of US\$0.09 million for maintenance.

3. The project became effective in April 2010 and was originally scheduled for completion by 30 June 2014 with grant closing by 31 December 2014. An 18 months extension was subsequently granted to allow for completion by 31 December 2015 with grant closing by 30 June 2016.

4. The project goal is to contribute to empowering the rural poor to increase their food security, income and resilience to shocks. The purpose of the project is to improve access of the rural poor to markets and social services.

5. The main problem addressed by the project was the lack of a passable rural road during the rainy season. The project design called for building such a road to improve mobility for Butana inhabitants and facilitate access to markets and social services. The main innovative feature of the project was the spot improvement approach and the setting up a community road fund (CRF) for rural road maintenance.

### Assessment of Relevance

6. RAP is aligned with national policies and priorities of the Government of Sudan and contributes directly to achieving IFAD country programme strategic objective. RAP objective is consistent with the overall IFAD strategic objectives under the Strategic Framework 2007-2010, and RAP like intervention will continue to be relevant in the future in similar topographic areas of Sudan. It is equally relevant to the needs of the Butana rural communities to enable access to markets and social services by reducing mobility constraints during the rainy season.

7. The road design was intended to complement rural roads constructed under the Agricultural Revival Program (ARP) using the cost effective spot improvement approach. The redesign of the Al Subagh – Sitta Arab stretch of road, entailing a shift from spot improvement to stretch gravel embankment, was dictated by soil conditions. Despite the higher cost, this change was approved by the National Highway and Bridge Authority (NHBA).

8. The relevance of RAP is rated very satisfactory (6).

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<sup>1</sup> The mission was composed of Mr Hassan Damous, Team Leader; Mr Mohamed Abdelatif, Deputy Team Leader and road specialist; Mr El Fadul Ishag, Programme Support Officer, ICO/Khartoum; and Mr Yonas Mekonen, Associate Programme Officer, ICO/Khartoum. Prior to project completion review mission, the project carried out an impact assessment.

## Assessment of Effectiveness

9. At the end of December 2015, progress on one of the two road segments, Alsoubagh to Sitta Arab, was an estimated 30 per cent, with an original contractual completion date of 30 June 2014. During the last supervision mission of June 2015, the main contract was retendered into six smaller contract units to speed up implementation and allow several constructors to work in parallel, after concluding that the contractor was unable to perform and deliver within the agreed timeframe.
10. The design and construction work are of the highest quality as attested by the consulting firm's report and IFAD civil engineer's ground assessment during successive supervisions and implementations support missions. In addition, the consulting firm prepared and implemented road maintenance training programme for Ministry of Physical Planning and Utilities' (MPPU) technical staff and communities; and shared maintenance manual to the MPPUs.
11. Road construction was to be accompanied by innovative preventive maintenance arrangements financed through Community Road Fund (CRF). However, the CRF had not been set up by the time of project completion. The main reasons include the failure of the PMU to form CRF and the State MPPUs and localities to issue the required decrees to enforce road collection fees. In close consultations with the BDA Board of Directors (BoD), localities and MPPUs, resources will be provided under the Butana Integrated Rural Development Project (BIRDIP) to operationalise the CRF.
12. Under component 2, the Butana Development Agency (BDA) supported the MPPUs with vehicles and logistical equipment such as surveying and small field equipment. In addition, about 20 days of training had been provided by the consultant to engineers of the road departments at MPPUs. At completion, 16 trainees from the targeted road departments had attended the training. A total of five MPPU engineers received training in designs, testing of materials and the adaptation of the designs and standard drawings to sites.
13. Community-based organizations (CBOs) were trained on conservation and water control works; a total of 493 terraces covering 2,450 feddans were either constructed or rehabilitated along the boundaries of the existing farms adjacent to the road. Although not planned at design, RAP broadcasted tree seeds to cover gold mining pits along the road to mitigate environmental impact for a total area of 12,000 feddans, covering about 108,000 mining pits.
14. Seedlings along terraces to enhance windbreaks were introduced by RAP and the BIRDIP to stabilize and protect the road against wind erosion. At completion, 90 per cent of the cultivated land (6,277 ha) located near the targeted 22 communities along the newly constructed road stretch has been placed under improved agricultural management practices including terracing and increased use of modern inputs.
15. The overall disbursement reached, as of the 31st of December 2015 was 93.1 per cent of the grant amount. The selection of procurement of major items were subject to review by the PMU and the Programme Steering Committee (PSC). Audits were conducted by independent firm selected competitively, and audit reports were found to be timely and unqualified.
16. RAP effectiveness is rated **moderately unsatisfactory** (3).

## Assessment of Outcomes and Impacts

17. Overall outreach was assessed at about 68,801 direct beneficiaries. The project had reached 8,831 households, or 59 per cent of the appraisal target of 15,000 households, and 61 per cent, or 1,031 women out of 1,700 planned in the design to benefit from trading in the markets following the road alignments. Data from the Results and impact management system (RIMS) for 2015 showed that 36,866 men and 31,935 women in the targeted population living adjacent to the newly constructed road in the targeted 22 communities received project services. Indirect beneficiaries were estimated at 55,000. Targeting and outreach is rated moderately satisfactory (4).
18. *Households' incomes and assets*; rated 4, moderately satisfactory. The survey carried out in 2015 showed that 33 per cent of the targeted households in the 22 targeted communities along the road under construction saved part of their incomes to purchase households utilities, and that 30 per cent of households in the targeted communities had used part of their savings to purchase livestock.
19. *Human and social capital and empowerment*; rated 4, moderately satisfactory. The communities were heavily involved in the construction and rehabilitation of terraces as part of SWC

works. Sensitisation and consultations also empowered communities to assist the project is peacefully resolving land related disputes arising from the road construction. Completion of the roads will contribute to further empowering geographically isolated communities, improving their livelihoods by increasing their mobility, access to markets and enabling them to gain better access to social and economic benefits. These changes, notably triggered by the program 's constructed crossings are clearly contributing to an enhanced sense of human security and empowerment.

20. *Food security*; rated 4, moderately satisfactory. The survey data also revealed that 8.2 per cent of the surveyed households in 2015 reported that they had experienced one hungry season while 36 per cent of the surveyed households reported that they experienced two hungry seasons six years ago. However, there is no clear evidences in the RIMS to attribute this improvement, or reduction in the lean season in the project area, directly to the road construction.

21. *Institutions and policies*; rated 3, moderately unsatisfactory. One of the significant RAP objectives was to establish CRF and mainstream the spot improvement approach into national policy, through closely involving the NHBA and MPPUs during the road construction and supervision. In parallel, the Butana and River Atbara localities were expected to issue decrees to establish the CRF. While these institutions showed interest, no tangible steps had been taken at completion. Lack of ownership and institutional capacity prevented forging effective partnerships between key players in the sector at various levels and lasting policy and institutional impacts.

22. *Agricultural productivity*; rated 3, moderately unsatisfactory. RAP target group benefited from the synergies developed with BIRD, implemented in the RAP project area by the same lead executing agency, the BDA. RAP's support to establishing Soil & Water Conservation (SWC) Structures, coupled with BIRD dissemination of productive enhancing technologies (crop production technologies, water harvesting and infrastructure management) resulted in 65% of the surveyed farmers from villages around the road route reporting that their agricultural production and productivity had improved as a result of both expansion of cultivated land and increased sorghum yield by 20% and fodder by 56%.

23. *Access to markets*; rated 3, moderately unsatisfactory. Without improved access, road users in the Butana would continue to face considerable constraints in accessing livestock markets, especially during the rainy season (Kharif).The prevailing seasonal mobility constraints associated with high transportation cost has improved due to the construction of crossings at certain locations along water courses and will be multiplied after the completion of the road.

24. *Environmental & Natural Resource Management*; rated 3, moderately unsatisfactory. The BIRD and RAP team formed and organized interest groups to increase the adoption good management practices of the natural resources through five joint awareness and inter-communities knowledge sharing event. The Butana suffers from uncontrolled expansion of gold mining with potentially negative impact on the sustainability of the completed road. The extent of this nationwide phenomenon calls for a comprehensive policy response. In response, the project is attempting to mitigate the environmental damage in the area through efforts such as afforestation by broadcasting trees seeds on the edge of dug pits to mitigate the impacts of the mining activities around the road. Since 2013, RAP broadcasted seeds to cover gold mining bits around the road in an area of 12,000 Feddans.

25. The rural poverty impact is moderately satisfactory (4).

### **Targeting and Gender Strategy**

26. RAP followed the Butana Integrated Rural Development Project (BIRD) targeting strategy and selection criteria methodology, articulated around the formation of interest group (village road committees) and ensuring strong women representation in trainings & membership in Village Road Committee (VRC). These communities were selected based on: i) previous engagement with BIRD and ii) close location vis-à-vis the road bearing in mind the positive implications this would have in terms of ownership, early detection of physical measures required for maintenance and sustainability.

27. The project Logical Framework is gender sensitive and specifically incorporated a higher level gendered indicator, expecting that women would benefit from increased trading opportunities; 1,031 women or 61 per cent of the planned targets benefited from RAP interventions. The project

design mainstreamed gender at all stage of implementation, including during the training and capacity-building initiatives. RAP Gender equity and women empowerment is moderately satisfactory (4).

### **Assessment of Efficiency**

28. The contract of the original consulting firm was valued at US\$869,115 (SDG 5,388,523). However, following six amendments, the consulting contract was extended to the end of April 2016 for a total contract value of US\$2,162,979 (SDG 13,410,469,8), or around 16 per cent of the total civil works contract.

29. The initial road design based on the spot improvement approach is cost effective relatively inexpensive compared to the paved roads or gravel embankment roads usually constructed in Sudan. The scope of the consulting contract was expanded to include a redesign of the Alsoubagh-Sitta Arab stretch due to the deficient quality of the design prepared by the MPPU of Gadaref state, lengthening the design phase by a year and increasing overall cost given the project approach shift from the cost effective spot improvement to raised embankments.

30. Supervision Missions recognised the low performance of the PMU to implement recommendations, i.e. in recruiting a legal adviser to draft the by-laws to establish the CRF or civil engineer to be based at the Consulting firm HQ.

31. The project delivery approach did not materialise as planned, with the early disengagement of key stakeholders, including the NHBA and MPPUs. The PMU was not able to propose workable arrangement for all parties with appropriate incentives structure in place.

32. For calculating the economic internal rate of return (EIRR) and net present value (NPV), the net benefits stream is discounted over the project life (20 years). The overall estimated economic internal rate of return (EIRR) for RAP is at 12 per cent discount factor, and NPV at 12 per cent discount factor is about US\$9,018,465 (55,914,483).

33. The overall efficiency is moderately unsatisfactory (3).

### **Assessment of Partners and IFAD's Performance**

34. *Government*; rated moderately unsatisfactory, 3. After receiving on site job training for its engineers, the State's MPPUs gradually disengaged from joint supervision and monitoring activities. The NHBA was equally absent from the project's implementation phase.

35. *BDA*. In practice, the BDA has not taken an active role in following and monitoring the project activities. After recruiting a highly competent Consulting firm, it relied almost entirely on this external expertise, without adequately anchoring itself in the implementation.

36. *The consulting firm (SMEC)*. The Consultant provided high quality training to various stakeholders whose satisfaction were high. Although contractors failed repeatedly to meet targets, the consultant maintained close interactions and monitored their activities on a daily basis, maintaining a solid monitoring and recording system during the overall process.

37. *IFAD*; rated moderately satisfactory, 4. The feedback from the concerned State Ministries and the consulting firm on the quality of supervision and implementation support was very positive. IFAD, through the ICO, has been proactively addressing implementation constraints with sustained follow up and frequent implementation support which contributed significantly to improving the performance of the Programme.

### **Innovation, Replication and Scaling up and Sustainability**

38. *Innovation*; rated 3, moderately unsatisfactory. Despite preliminary undertakings to operationalise the CRF, these had not been set up at project completion. The failure to set up the CRF will have significant negative implications for the sustainability of the constructed works.

39. *Replication and scaling up*; rated 3, moderately unsatisfactory. No scaling up had taken place because of the limited role of the National Highways and Bridges Authority (NHBA) and the MPPUs. However, the spot improvement works well on more than 60% of the planned road. Although their role in promoting and scaling up this innovation was to be key, the NHBA and MPPUs did not undertake a campaign to promote adopting the spot improvement approach as a feasible alternative for construction of other feeder roads, in particular state roads in the rainfed areas. Scaling-up the

construction of crossings to enable passability during the rainy seasons should be pursued given the high and immediate impacts for communities.

40. *Sustainability*; rated 3, moderately unsatisfactory. Overall and despite the significant delay registered by the project, there are still good potential prospects for medium term sustainability of RAP outputs and outcomes, *if* the most pressing challenge of establishing the CRF is addressed. Indeed, an unfinished road combined with lack of maintenance management system does not provide the expected benefits. The economic and technical sustainability is high: the outputs served the needs of the beneficiaries, and the updated socio-economic study commissioned by RAP indicates that the sense of ownership of the road is high, indicating commitment to maintenance and sustainability in addition to a willingness to pay for road use. It also underlines the continued relevance of completing the road as key to unlock the economic potential of the Butana.

### **Overall Lessons Learned**

41. Lessons learned and recommendations are proposed to consolidate and sustain the results achieved by the programme and guide the design of future integrated rural infrastructure development projects. Associated recommendations are made in the Section G below.

#### *Cost Effective Rural Feeder Road Design*

42. **Overall lesson 1.** In context where partners have low monitoring and supervision capacity during the implementation of large rural infrastructure project, high technical specifications can lead to delay, cost escalation and significant financing gap.

#### *Procurement*

43. **Overall lessons 2.** The first advance payment, amounting to 35% of the value of contract in RAP, proved to put additional unforeseen risks on RAP operations.

#### *Financial Sustainability*

44. **Overall lesson 3.** The expansion of the consultancy contract and the implications stemming from the price escalation has jeopardised the project's financial sustainability.

#### *Contract management of Large Engineering Contract:*

45. **Overall lessons 4.** The large engineering contract falling under component 1, Physical Rehabilitation and Construction of Rural Roads, was not suitable in the given context where the number of qualified contractors are limited and characterised by prevailing low managerial skills and weak financial capacity.

#### *Capacity building*

46. **Overall lessons 5.** Only one surveyor engineer, less than 15% of targeted beneficiaries of on the job training, continued working with the Consultancy firm throughout the project. The remaining trained MPPUs staff returned to their original duty stations after participating in the design phase and early stage of constructions supervision.

#### *Monitoring & Implementation*

47. **Overall lessons 6.** Monitoring and quality assurance should not be left to a consultancy firm. In infrastructure project, the client should hire a qualified engineering staff on the site to act as a reporting and liaison staff.

#### *Replications & Scaling-Up of Innovations*

48. **Overall lesson 7.** Spots improvements are proving a successful, cost effective and efficient solution pending simple but rigorous soil type analysis are undertaken to confirm feasibility and their materialisation.

#### *Sustainability*

49. **Overall lessons 8.** The delay in starting the construction operation has had negative implications on the progress of establishing the CRF, a core sustainability pillar for the maintenance of the road.



## A. Introduction

1. The Government of Sudan and the International Fund for Agricultural Development (IFAD) agreed on three strategic objectives as part of the Sudan country programme strategy for the period 2009-2012. The third objective, "increased access of poor rural women and men to markets", seeks to align the IFAD cofinanced country programme with the stronger focus on marketing of the Government's Agriculture Revival Programme (ARP). Given the massive and widespread poverty in Sudan and the challenges facing the agriculture sector, the Government and IFAD agreed that the country programme would adopt an integrated rural development approach based on: (i) consolidating ongoing projects to strengthen their impact and sustainability; (ii) strengthening the marketing component in ongoing projects; (iii) systematically seeking complementarities and partnerships with ongoing operations in project areas; and (iv) balancing investments in capacity-building and productive activities.

2. It is in this context that the Government of Sudan and IFAD agreed to include the Rural Access Project (RAP) as part of the 2009 pipeline. The geographic focus of the intervention is the Butana area in Eastern Sudan where IFAD is cofinancing the ongoing Butana Integrated Rural Development Project (BIRDP). The investment in rural feeder roads complements the investments made in road infrastructure, marketing, production and community development under the BIRDP.

3. RAP was approved by the Executive Board in December 2009. The project financing plan consists of a DSF grant of US\$12.95 million, a government contribution of US\$1.92 million in the form of duties and taxes, and a contribution by beneficiaries of US\$0.09 million for road maintenance. The project became effective in April 2010 and was originally scheduled for completion by 30 June 2014 with grant closing by 31 December 2014. The project has been extended twice at no extra cost to allow for project completion by 31 December 2015 and grant closing by 30 June 2016.

4. The project completion review (PCR) joint mission took place from the 22 March to 4 April 2016 during which a total of six days was spent in the field interacting with implementation partners and beneficiaries. Represented institutions included the relevant Government of Sudan (GoS) counterparts - the Ministry of Finance & Economic Development (International Cooperation Directorate; MoFED) & the Ministry of Agriculture & Forestry (MoA&F), the Programme Management Unit (PMU), two external consultants and IFAD.

## B. Project description

### B.1. Project context

5. **Performance of the agriculture sector.** Agriculture is the main source of livelihood for Sudan's rural inhabitants, and accounted for 28.2 per cent of GDP in 2014. The main field crops produced in the rainfed sector are sesame, sorghum and gum Arabic and accounted for 14.2 per cent of the total Sudan exports in 2014, while the livestock subsector accounted for 19.7 per cent of the total exports in 2014.

6. **Agriculture growth rate.** The country's agriculture growth rate is highly variable: 2.4 per cent over the period 2000-2008, 4.0 per cent in 2013 and 4.1 per cent in 2014. In the rainfed sector, disappointing growth can be attributed to the vulnerability of agricultural production to climate variability, leading to declining and erratic yields. The traditional rainfed sector accounted for an average of 14.9 per cent of agricultural GDP during the period 2000-2008, and is the most important subsector for the agricultural economy and the livelihoods of poor rural people.

7. **Challenges.** Weak agricultural performance is perpetuated by many factors, the most important of which are as follows: marketing arrangements that reflect chronic low productivity and low output value in rainfed agriculture and pastoral production; high internal cost of transport due to limited road infrastructure, especially in rainfed areas; high charges and taxes in the marketing chain; and weak organization and bargaining power among small-scale producers.

8. **Rural roads subsector.** For a vast country such as Sudan, the existing transport infrastructure and facilities are poor and are considered the single most important constraint on the development of agricultural markets and market access by small producers in rainfed areas. The road network,

originally poor, has deteriorated further with limited budgets. The lack of feeder roads that would be conducive to rural development is quite evident. The poor infrastructure situation has had an adverse impact on the movement of agricultural products. Marketing charges and associated transaction costs have also impacted producers negatively in the traditional rainfed sector.

## **B.2. Project objectives**

9. The project goal is to contribute to empowering the rural poor to improve their food security, incomes and resilience to shocks. The purpose of the project is to increase the access of the rural poor to markets and social services.

10. Three key results/outputs were expected from the project:

- Rural roads upgraded in Central Butana and regularly maintained. The project target is 144 km.
- Communities are trained to manage road tolls and to engage in labour based maintenance contracts;
- State capacity is strengthened to plan, design, supervise, and maintain rural feeder roads using the spot improvement approach;
- Project approach mainstreaming by NHBA and MPPUs.

11. The above goal, purpose and outputs were to be achieved as a result of implementation of the following three project components: (i) physical rehabilitation and construction of rural access roads; (ii) capacity-building and institutional development of road departments at MPPUs in Gadaref and Kassala states and training of communities on SWC to protect the road from gully erosion; and (iii) project management.

12. The main problem addressed by the project was the lack of a passable rural road during the rainy season. The project design called for building such a road to facilitate easy access of the Butana inhabitants to markets and social services. The road design as originally proposed was cost efficient and well adapted to the flat Butana area. The original designers intended to adopt a spot improvement and preventive maintenance approach to facilitate easy movement of vehicles and animals over small seasonal streams and khors [creeks] during the rainy season.

13. Spot improvement and preventive maintenance is an innovative design approach applied to the largest section of the road; El Subagh-Husheib (80 km). On this road, 46 culverts were constructed to facilitate vehicle movements over seasonal streams and khors.

14. However, the international consulting firm hired by the project changed the design of the El Subagh-Sitta Arab section (74 km) from spot improvement and preventive maintenance to a full stretch gravel/embankment road. The redesign of this section of the road was completed in December 2013. The main rationale for this change is that the surveyed alignment of the proposed route showed many muddy depressions that would obstruct the smooth movement of vehicles during the rainy season. NHBA, which is mandated to review and approve road designs in the country, approved the change for the EL Subagh-Sitta Arab section of the road from spot improvement to full stretch gravel road. This led to a one-year delay in the commencement of project activities.

## **B.3. Implementation modalities**

15. The lead project agency was BDA, in the role of financier and client. The consulting firm to be hired by the BDA was to provide a technical team responsible for supervising road construction and providing training and backstopping to the road departments in Kassala and Gadaref states and the communities.

16. NHBA, given its mandate and collaboration with the states, was to undertake project monitoring with a view to mainstream its approach in government policy and programmes for rural roads, and subsequent replication.

17. The localities concerned by the road alignment proposed under RAP were the Butana in Gadaref and River Atbara in Kassala. The main role of these two localities was to submit to the local



councils for discussion and approval an administrative decree regulating the levy of road tolls and market fees, and channelling of the proceeds to the CRF.

18. The 21 communities situated along the road were expected to form village road committees to be responsible for supervising road construction and reporting any problems to the localities and BDA, including reporting road breaches during the rainy season; as well as applying for labour-based contracts for road maintenance works.

19. The main innovative feature in the project is the spot improvement approach to road construction and the establishment of a CRF for rural road maintenance. The use of labour-based community contracting in remote or rural areas for some of the maintenance works can be considered an innovation reducing the cost of maintenance.

20. The NHBA's role was limited to approving the design by the consulting firm. NHBA involvement in construction, supervision and monitoring gradually declined. It was not clear whether this occurred as a result of a lack of coordination, capacity or motivation.

21. The establishment of the CRF and issuance of the necessary by-laws and decrees to levy market fees and road tolls to finance road maintenance were delayed to allow construction works to be completed first. Since the construction works were not completed, little or no progress was made on setting up the CRF.

22. The 3.5 km length of road linking Sitta Arab to New Halfa passes through a lowland area that is subject to flooding during the rainy season, hindering traffic and endangering the village of Sitta Arab. This contract is complementary to the one for the Al Subagh-Sitta Arab section, and is intended to link the road to New Halfa. The contract was designed and supervised by the RAP consultant under its contract for the project. The construction contract itself was financed by Kassala state with a contractual value of US\$1.36 million.

23. The total investment and incremental recurrent project costs, including physical and price contingencies, are estimated at US\$14.96 million. Major investments were for the physical rehabilitation and construction of rural roads, representing 80 per cent (US\$10.71 million) of overall project base costs. The capacity-building and institutional development component accounts for 17 per cent (US\$2.25 million) of overall investment and project management for 3 per cent (US\$0.4 million).

24. IFAD was to finance the project together with the Government of Sudan and the beneficiaries. IFAD was to contribute US\$12.95 million (86.6 per cent) in the form of a grant. The beneficiaries were to contribute 100 per cent of the road maintenance funds in the fourth year of the project for an estimated contribution of US\$0.09 million (0.7 per cent) of overall project costs. The Government was to finance US\$1.92 million (12.9 per cent) in the form of duties and taxes in accordance with the principle that no taxes or duties were being financed with the IFAD grant proceeds.

#### **B.4. Target groups**

25. The project target group consists of 130,000 people in the Butana area. Poor rural households constitute about 80 per cent of the rural population of Butana, and 15,000 of them were expected to benefit from the project. RAP road alignments span two isolated localities in Gedaref and Kassala state, specifically targeting 21 communities, 20 in the Butana locality in Gedaref state and one in the River Atbara locality in Kassala state. According to the latest 2016 socio-economic survey of the project area, the total population of the targeted villages in the dry and wet seasons is 41,858 and 45,610, respectively, with an estimated average household size of five (RAP socio-economic survey 2016).

26. The project area is arid and environmentally sensitive, with a low population density. The target group's main livelihood is derived from rainfed agriculture and traditional livestock rearing. Livestock ownership is a sound indicator of poverty status, with poor households owning less than 10 head of livestock, medium around 30 and well-off between 100 and 300. Among the key constraints hindering poverty reduction for the target group are mobility and market access caused by poor road networks that become impassable during the rainy season.

27. Poor rural producers suffer most as a result of high transportation and transaction costs in the movement of agricultural products (high price of farm inputs and low farm gate prices) and limited

access to basic social services such as health and education. Inadequate social services and limited employment and marketing opportunities primarily affect women, including pregnant women, young people and children, as evidenced in high illiteracy, mortality and malnutrition rates. The project design specifically proposed to address these structural constraints for poor rural producers and vulnerable groups, including women.

## **C. Assessment of Project relevance**

### **C.1. Relevance vis-à-vis the external context**

28. RAP is considered a relevant intervention as it contributed directly to achievement of the country programme strategic objective of increased access by rural poor women and men to markets and social services. RAP's main objective is consistent with the government's ARP, which focuses on rural infrastructure for productive and marketing purposes. The ARP has an indicative programme of rural road construction but did not consider spot improvement as an alternative approach to improve rural poor people's access to markets and social services. ARP also did not address needed capacity-building for road departments in its intervention areas, or preventive maintenance. However, the ARP programme has come to a standstill and is currently not functioning.

29. RAP was designed to bridge the above three important gaps in the ARP programme. In extending the rural road network to traditional rainfed areas and livestock concentration sites during the rainy season, RAP activities were relevant and will continue to be so. Access by rural poor people to markets was a key IFAD strategic objective under the Strategic Framework 2007-2010. The project was in compliance with the provisions of the learning note on community participation in planning, priority setting, implementation and follow-up for infrastructure and rural travel and transport projects.

30. The RAP approach includes the following main elements: (i) strategic rural road plans for each state linked to a strategic national road network; (ii) improved technical capacity to draw up road specifications, design, supervision and maintenance; (iii) competitive and transparent bidding; (iv) preventive maintenance of roads and community awareness; and (v) participation in road maintenance to help decrease the overall capital costs of rural roads. In view of the above, it is clear that RAP was a relevant intervention in terms of both context and sound agricultural policy objectives.

### **C.2. Internal logic**

31. The large size of Butana and its fragile ecological systems place special demands on transport facilities, communications and other infrastructure services. Although poor infrastructure has long been one of the main development problems in Sudan, many areas - such as Butana with its low population density - have been particularly neglected. Most places lack roads and stream crossings, and where they do exist they are in need of substantial repairs, rehabilitation and upgrading.

32. Without improved access, road users in Butana will continue to vary the routes that they take, causing considerable and widespread damage to soil and plant cover. Many of the roads connecting livestock markets in Butana are not passable during the rainy season (Kharif) and where passable, transportation costs are high. The solution is to build crossings at certain locations along water courses.

33. It was in this context that the Government of Sudan and IFAD agreed to include RAP in the 2009 programme. The geographic focus of the intervention was on the Butana area in Eastern Sudan to complement the IFAD-co-financed BIRDP.

34. The RAP design called for adopting the spot improvement and preventive maintenance approach as the most suitable solution to rural access in Butana given the area's low population density, seasonal trade activity and relatively short rainy season. The project design also provided for capacity-building, community participation and gender mainstreaming, as well as road maintenance. Although the proposed project activities were found appropriate, cost effective and realistic, inaccurate assumptions caused the spot improvement to be used everywhere in the project area, provoking significant implementation delay. Given the resulting financing gap and protracted delays in implementation, it was highly unlikely that all the project objectives could be achieved in a timely manner.

### **C.3. Adequacy of design changes**

35. A summary of the changes are presented below. Due to issues related to the quality of designs submitted by the MPPU of Gadaref state, the scope of the consulting contract was expanded to include redesigning the El Subagh-Sitta Arab stretch of road. Several changes were made to adapt project implementation to realities in the field.

36. The original design approach to road improvement was based on the engineered natural surface (ENS) approach, with upgraded sections identified as spot improvements. These improvements were to be made in areas with depressions, very poor soil and drainage lines crossing the road alignment. In these sections, culverts and wash crossings (Irish bridges) would be provided and the road alignments would be improved and raised by a minimum of 0.50 metres above the local ground surface. During the redesign phase it was found that this concept was not appropriate for the Subagh to Sitta Arab stretch, and that full stretch improvement was needed, including a raised embankment, lower sub grade, upper sub grade and sub base layers.

## **D. Assessment of Project effectiveness**

### **D.1. Physical targets and output delivery**

37. Component 1: Physical rehabilitation and construction of rural roads. According to the project design, a qualified contractor was to be hired through national competitive bidding following a prequalification process. The road departments of the MPPUs were to monitor the contractor's performance and certify payments for the completed works. The MPPUs were the contracting authorities for road construction. The consulting firm was to carry out the role of construction supervision and assist BDA in setting up the CRF. The CRF was to be established within the BDA for planning, financing and reporting on road maintenance works.

38. RAP achieved some of the targets set, including the survey and design of 77 km completed for upgrading the El Subagh-Sitta Arab road. In addition, survey and design were completed for 62 km of spot improvement for the El Subagh-Husheib road. Physical improvements were partially completed for the El Subagh-Sitta Arab road to make the road passable, including construction of 51 of 54 road crossings. Currently three crossings and the earth works for 17 approaches are under construction, and should be completed to make the road passable. Spot improvement for the El Subagh-Husheib road was also partially completed, with the construction of all concrete structures (11 crossings) and the earth works for 10 approaches up to the deck slab level finished. Earthworks for the last approach is continuing, and should be completed to make the road passable.

39. The project suffered initial delays at its earlier stages due to issues related to design assumptions. These issues also led to increased costs by expanding the scope of the consultancy assignment and changing the approach for significant sections of the road from spot improvements to raised embankment. Furthermore, there were serious delays in implementation of the El Subagh-Sitta Arab road contract. These delays were mainly due to poor contract management by BDA and low performance by the contractor and resulted in price escalation.

40. SMEC PTY International Consultancy Firm was contracted and commenced work in October 2010 to:

- Review the designs made by MPPUs of Gedaref State and to carry out construction supervision for Alsoubagh-Sitta Arab road stretch and associated crossings;
- Design of 7 crossings on Husheib-Alsoubagh section and construction supervision;
- Design of Sitta Arab to link canal (start of the road to New Halfa) and construction supervision.

41. In addition to construction supervision activities, the Consultant was assigned the task of designing 10 crossings as part of the BIRDP activities. The original Consultancy contract had a total contractual amount of US\$869,115 and SDG 5,388,513. Six addendums were made till now to extend the contract until 30 April 2016.

42. SMEC Consultants reported regularly on the progress to IFAD, the BDA and the Government. In turn, quality assurance systems were put in place through closed supervisions and follow-up, including IFAD's supervision and implementation support mission. Fulfilling specifications acted as a pre-requisite for the delivery of certificate from field staff to effectuate final payment.

43. The Alsoubagh to Sitta Arab contract with KAF Contractor comprises most of the construction of the road stretch from Alsoubagh to Sitta Arab. The length of this section of the road is 74 km and initially designed as a gravel road with 46 planned crossing structures and then increased to 54 without including the crossings over Khor Geegy. The latter bridge over the Geegy river is constructed under a separate contract.

44. The works under this contract, awarded to KAF, have been under construction since May 2013. The revised contract value is SDG 56,253,814 including price escalation and new unit rates for over hauling and over burden. Packages one and three detailed below remained with KAF and include earth works and embankments for lower sub grade. Although the original contractual completion date was 30 June 2014, progress up to the end of December 2015 was an estimated 30 per cent.

45. The contractor has submitted four claims for extension of time as well as other (monetary) compensation requests, which were evaluated by the Consultant and Committees formed by the Federal and States Governments.

46. As the status of this major contract became critical and all urgent works allowing full usage of the road must be completed before the RAP completion date, it was decided to split the works into six packages<sup>2</sup> and retender them, by the shopping method.

47. **Package 1:** Alsoubagh-Husheib stretch – Seven crossings

Scope of Work	Achievements
The contract agreement was signed on 28 April 2014 with Sayed Abdalla Alsayed Engineering Company (SAS). The total contract value was SDG 8,428,972.00 from IFAD plus VAT equivalent to SDG 1,432,925.00 payable by the federal Government. Two additional culverts were later included based on the site conditions, increasing the contract value by SDG 401,005.	The contractor started work on 25 August 2014, for a contract duration of six months. The execution of culvert works started on 1 November 2014. According to the progress report prepared by the consulting firm, progress as of 31 December 2015 was about 80 per cent. The balance remaining is the earthwork component. The contractor indicated that the delay in the earthwork component was due to the lack of water in the nearby area.

48. Sub-Package 1: Khor Al Geegy crossings

Scope of Work	Achievements
The contract agreement was signed on 22 September 2014 with Sayed Abdalla Alsayed Engineering Company, the same enterprise contracted for the seven crossings, for a contract duration of six months. The revised contract value is SDG 6,492,003 excluding VAT.	The contractor started with the soil investigation (bearing capacity assessment) on 28 November 2014. Physical work commenced in late February 2015. The bridge and associated culverts stretches over a 1.5 km length. Work completed by the end of December 2015 is estimated at 84 per cent of the total revised contract value. The balance remaining is the earthwork component, and the contractor does not have sufficient equipment on site to complete it.

49. **Package 2:** Alsoubagh to Sitta Arab – Structures

Scope of Work	Achievements
The contract agreement was signed on 5 October 2015 with SAS. The contract value was SDG 1,983,000 excluding VAT.	The contractor has finished the four pipe culverts included in the contract. Work completed by the end of December 2015 is estimated at 30 per cent of the total contract value. The balance remaining is the protection work, and the contractor does not have sufficient equipment on site to complete it.

<sup>2</sup> Contract duration of 6 months and only 4 months for package 6.

50. **Package 3:** Alsoubagh to Sitta Arab – Approaches and earthworks

Scope of Work	Achievements
The contract agreement was signed on 20 September 2015 with Sharian Al Shamal Company. The contract value is SDG 3,291,000 excluding VAT.	Work completed by the end of December 2015 is estimated at 108.41 per cent of the total contract value. Any future pending work may be awarded to this contractor as it is the only one to have completed the contracted work on time <sup>3</sup> .

51. **Package 4:** Alsoubagh to Sitta Arab – Structures and approaches

Scope of Work	Achievements
The contract agreement was signed on 6 September 2015 with HEWA for water drilling. The revised contract value is SDG 7,517,050 excluding VAT.	Work completed by the end of December 2015 is estimated at 73 per cent of the total contract value. The balance remaining includes the approaches, protection and ancillary components. The contractor indicated that the scarcity of water near the site is the main reason for the delay.

52. **Package 5:** Alsoubagh to Sitta Arab – Structures, approaches and earthworks

Scope of Work	Achievements
The contract agreement was signed on 6 September 2015 with HEWA for water drilling. The contract value is SDG 4,759,700 excluding VAT.	Work completed by the end of December 2015 is estimated at 58 per cent of the total contract value. The balance remaining includes the approaches and protection components. The contractor indicated that the scarcity of water near the site was the main cause of delay.

53. **Package 6:** Alsoubagh to Sitta Arab – Structures, approaches and earthworks

Scope of Work	Achievements
The contract agreement was signed on 6 September 2015 with Sayed Abdalla Alsayed Engineering Company. The contract value is SDG 6,517,900 excluding VAT.	Work completed work by the end of December 2015 is estimated at 37 per cent of the total contract value. The balance remaining includes the embankments, approaches and protection components. The delay in completing this contract was attributable to the contractor's inability to procure the required equipment on site.

54. Component two: Capacity-building and institutional development. Component two was geared towards strengthening institutions responsible for road design, construction and maintenance. The expected outcome was to strengthen state MPPUs and form community-based organizations in the form of road committees to manage infrastructure and enhance sustainability. At the outset of the project, BDA supported MPPUs with vehicles and other logistical support, such as surveying equipment, small field equipment etc. The project also provided the consulting firm with furnished rented accommodation and an office in Gadaref, as well as accommodation and an office in Es Subagh.

55. At Mid-Term Review (MTR), about 20 days of training had been provided by the consultant, mainly in the form of lectures and seminars. Nine participants from Gadaref state and four from Kassala state attended this training. In addition, three senior engineers from Kassala were trained in computer-aided design and AutoLand software. At completion, a total of 16 trainees from the targeted entities were trained and are currently performing their regular duties at the MPPUs of Kassala and Gadaref. In addition, the consultant provided practical on-site training for staff in planning, design and construction management, supervision and maintenance of rural access roads. With enhanced set of applicable skills, the trained engineers became increasingly capable of supporting the consulting firm in their monitoring and supervision responsibilities. During the course of the project, and as an indication to the quality of the training provided, a large number of trainees found employment in the Gulf.

<sup>3</sup> Sharian Al Shamal is an experienced company that have been long engaged in road construction implementing large scale projects. Key to its success was high financial turnover, the ownership of heavy machinery (compared to others contractors dependant on renting ones), skilled and committed staff and the provision of timely weekly plans with realistic execution.

56. A total of five MPPU staff (one geologist, three surveyors and one engineer) assigned to the construction site received training in design, testing of materials and adaptation of the designs and standard drawings. At completion, only one engineer from Gadaref state was on site, as a result of the client's inability to find reasonable accommodation and workable arrangements.

57. RAP-trained community-based organizations on SWC and water control works for road improvements. The interventions under the soil and water conservation subcomponent in catchments draining to road improvements were implemented through cooperation between the BIRD and RAP teams. At project start-up in June 2012, a three-day training of trainers (ToTs) workshop on SWC was attended by 15 participants, including five BDA staff and 10 community or village representatives. At completion, community training sessions had benefited a total of 260 community representatives, 37 per cent of them women from 16 newly created village road committees (VRCs) in areas adjacent to the road. Interactions with training beneficiaries indicated an overall high level of satisfaction. The impact of the various training programmes undertaken could be evaluated after road completion and benchmarked against communities abilities to lead water control works for road improvements.

58. At completion, progress included the construction and rehabilitation of terraces (bunds) along the boundaries of existing farms, which act as buffer zones for the road, reduce the erosive power of runoff and/or divert the runoff before it reaches the road. Since July 2014, RAP planned execution of 150 terraces; however, BIRD rehabilitated 95 terraces in Sitta Arab, Kassala state, covering 475 feddans, and constructed 146 new terraces in Gedaref state, covering an area of 730 feddans.

59. Furthermore, seedlings along terraces were introduced by RAP and BIRD to stabilize and protect the road against wind erosion (windbreaks). In 2013 and 2014, around 159 terraces were planted with *Acacia seyal* trees (Talih). The activity is expected to continue in 2016.

60. In addition to SWC training, targeted beneficiaries received an in-kind contribution from the project in the form of seeds to mitigate the impact of mining activities by covering gold mining areas around the road, thus enriching vegetation cover by an area of 12,000 feddans.

## **D.2. Project outcomes and impacts**

### **Household incomes and assets**

61. The M&E unit carried out an impact survey in December 2015 with a sample size of 999 households. The survey revealed that average annual income had increased by 50 per cent over the average annual income six years ago, including due to increased agricultural productivity. Asset ownership had improved for 21 per cent of the surveyed sample at MTR, to 49 per cent of the surveyed household in 2015.

62. This translated into 52 per cent having radio against 50 per cent during baseline survey, 15 per cent having television against 7 per cent at baseline, 82 per cent with a mobile phone against 70 per cent during baseline survey, and 27 per cent having vehicles against 13 per cent at baseline. However, this positive impact may not be wholly attributable to RAP as it is difficult to disaggregate the respective impact of BIRD and RAP.

63. An analysis of the survey data revealed that 17.5 per cent of the surveyed households realize savings from their cash income, which is 100 per cent higher than the savings realized six years ago.

64. The analysed data also showed that 33 per cent of the households who save part of their income used part of their savings to purchase land or properties. Additionally, 30 per cent of households who save part of their income used their savings to purchase livestock, thus increasing their herd, 16 per cent of the savers used part of their savings to purchase home requirements or renovations and 8.7 per cent of the savers used part of the savings to purchase agricultural tools and equipment.

## Food security

65. Furthermore, surveyed farmers reported that their herd size had increased by an average of 54 per cent and their average milk production had increased by 51 per cent. The survey data also revealed that 8.2 per cent of the households surveyed in 2015 reported that they had experienced one hungry season, significantly less than six years ago (36 per cent). The nutritional status of five-year old children based on the most widely used indicators (third level indicators) is presented in the table below.

**Table 1: Third level indicators measuring food security**

Results indicators	Unit	At MTR	At completion
Children underweight (height for age)	%	25.1	19.8
Chronic malnourished (weight for age)	%	25.5	23.9
Acute malnourished (weight for height)	%	12.6	11.3
Households who experienced one hungry season	%	36.0	8.2

## Agricultural productivity

66. The impact survey results also showed that the total area of land under improved management practices reached 6,277 ha out of 6,900 ha; i.e. around 91 per cent. Different technologies were introduced and disseminated in the project area for crop production, water harvesting and infrastructure management. Furthermore, 209 farmers including 62 women were trained in natural resources management. The impact survey carried out in December 2015 also revealed that 65 per cent of the surveyed farmers from villages around the road route reported that their agricultural production had improved (sorghum, guar, etc.) as a result of increased cultivated land and increased yields: 20 per cent for sorghum and 56 per cent for fodder. It is however difficult to attribute these results to RAP as BIRD also operate in the same communities and provide access to similar productivity enhancing technologies.

## Human and social capital and empowerment

67. Although the CRF has not materialized, awareness-raising campaigns were organized in five communities in the project area. Furthermore, the project team promoted coordination and knowledge sharing between neighbouring communities. The BIRD and RAP team also formed and organized interest groups to adopt good natural resources management practices. 102 members of the targeted communities obtained opportunities to work as labourers with road construction contractors. More labourers are likely to be employed through community contracts during the road maintenance period. These changes, notably triggered by the program's constructed crossings are clearly contributing to an enhanced sense of human security and empowerment.

## Access to markets

68. Access to markets and financial services before the road and during the rainy season is extremely difficult and associated with high transportation costs. For example, in the wet season, 52 per cent of communities prefer Es Subagh market, 24 per cent prefer a village or nearby market, 19 per cent prefer New Halfa market and 5 per cent El Edeid market. Without improved access, road users in the Butana would continue to face considerable constraints in accessing livestock markets, especially during the rainy season (Kharif). The prevailing seasonal mobility constraints associated with high transportation cost has improved due to the construction of crossings at certain locations along water courses. This speaks to the importance of creating crossings to facilitate access to markets and social services. This situation is likely to improve after completion of the road.

## Institutions and policies

69. Gender equity and women's empowerment. During its field visits to villages and communities, the mission noted the presence of women as members of road committees and other village development committees actively participating in meetings. The mission also met with one woman leader, Ms. Manal Taha, the representative of Sitta Arab village in the state legislative assembly of Kassala state.

## **Environment and Climate change adaptation**

70. Traditional gold mining around the road route areas has serious negative impacts on the surrounding environment. The damage caused by mining is mainly physical, comprising deforestation and de-vegetation, erosion and watercourse silting and disruption of drainage patterns. This situation needs to be studied to trigger a comprehensive and multi-sectoral policy response; otherwise it will have a negative impact on the sustainability of the road.

### **D.3. Targeting and outreach**

71. The BIRDP mobilized 21 RAP communities: one in Kassala state and the remaining 20 in the Butana locality of Gedaref state. Of these communities, 11 (52 per cent) are considered as direct road beneficiaries. These communities were selected based on: (i) previous engagement with BIRDP; and (ii) proximity to the road, with positive implications for ownership and early detection of problems and measures required for maintenance and sustainability. RAP followed a similar methodology and targeting selection criteria, articulated around the formation of interest groups (village road committees) with strong women representation. With regard to the effectiveness of the targeting strategy, the project team only started sensitizing, mobilizing and forming road interest groups once physical progress had been made. As a result, village road committees were only formed during the final year of the project.

72. Project management assumption behind involving them at a later stage of the project was based on the belief that it could only be done once the road construction is finished. The role of these committees is to assist in road maintenance and soil conservation. For the soil conservation window, some were involved from the beginning and in the future will participate in road maintenance.

73. At appraisal, quantitative targets were set, including better access to markets and social services for 15,000 rural poor producers and trading opportunities in markets for 1,700 women. The nature of the road as a public good implies that its benefits will extend beyond the RAP target group.

74. Ultimately, 10,000 days of work are expected to materialize as a result of road preventive maintenance, specifically benefiting disadvantaged groups through well targeted community contracted labour intensive road maintenance work.

75. The project had reached 8,831 households, or 59 per cent of the appraisal target of 15,000 households, and 61 per cent, or 1,031 women out of 1,700 planned in the design to benefit from trading in the markets following the road alignments. Among the beneficiaries of both BIRDP and RAP, 66 per cent are women; 35 per cent of those trained in natural resources management are women; and 46 per cent of the members of village road committees set up are women. In addition, women have benefited from the improved accessibility of services centres (hospitals, schools and markets), particularly during the rainy season.

76. In the future, health emergencies, especially for pregnant women, will be eased and communities representatives strongly confirmed this development as a great relief. This brings the total number of people having received project services up to 68,801 persons (91 per cent) of the 75,000 stated in the appraisal.

### **D.4. Innovation, replication and scaling-up**

77. The innovative feature of the RAP design is the spot improvement approach for road construction and the establishment of a CRF to empower communities to perform preventive maintenance. The first innovation did not materialize on one alignment due to the soil structure (Subagh-Sitta Arab alignment); on the second stretch from Subagh to Husheib, the spot improvement has yet to go through a rainy season to determine how viable and replicable it is. The CRF has not yet been established. In response to the gold rush in Butana and its detrimental environmental impact,<sup>4</sup> the project started broadcasting tree seeds on the edge of dug pits to mitigate the impacts of the mining activities around the road. Since 2013, RAP broadcasted seeds to cover gold mining bits around the road in an area of 12,000 feddans.

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<sup>4</sup> The PMU intends to undertake a study on the social and environmental implications of the gold rush experienced in the Butana. Additional lines of inquiry include the relationship between road users and the planned CRF.



78. One direct pathway for scaling up the spot improvement approach was collectively agreed upon at design: it relied on the inclusion of NHBA as a key stakeholder of RAP and was meant to complement the capacity-building provided to MPPUs at state level. Provisions were made to include developing a methodology for spot improvement and community-led road maintenance. Exposing NHBA to this benefit and providing training on new rural road approaches would permit dissemination and scaling up of this good practice.

79. By taking part in monitoring activities, the key partners for mainstreaming and replication in government policy and programmes for rural roads were the MPPUs and NHBA. At completion, the linkages with NHBA had been almost non-existent throughout project implementation and had gradually declined with the state MPPUs. Another key counterpart was supposed to be the ARP rural infrastructure working group, which no longer exists. Coupled with the delay, this meant that no scaling up had taken place.

80. Scaling up could be happened in the future especially in Butana as many areas need such approach and in the presence of BDA, this innovation would continue. This innovation is so relevant to Butana context where many seasonal rivers block the access of people and livestock to services and markets. All southern parts of Sudan require such innovation. Scaling-up the construction of crossings to enable passability during the rainy seasons is equally important and should be pursued given the high and immediate impacts for communities.

## **E. Assessment of project efficiency**

### **E.1. Project costs and financing**

81. The project cost was US\$14,968,7830: US\$12,958,730 from IFAD; US\$1,920,000 from the Government; and US\$90,000 from beneficiaries. This budget breaks down by component as follows: (i) physical rehabilitation and construction of rural roads, US\$12,217,120; (ii) capacity-building and institutional development, US\$2,341,370; and (iii) project management, US\$420,240. The actual disbursement by project component as of project completion date was 70.5 per cent, 94.5 per cent and 93.8 per cent for component one, component two and component three respectively.

82. In contrast, physical implementation of the main component of the project, component one, as of the same date was just 66 per cent. The poor rate of physical delivery was attributable to: (i) a revised project design, resulting in a construction delay and higher costs; and (ii) price escalation caused by the delayed start of construction works and ineffective project management. The lag in actual disbursements versus projected disbursements presented in the design report shows inefficiency in project implementation. The high implementation cost of component one compared to the original design estimate also reflects some level of implementation inefficiency.

### **E.2. Quality of Project management**

83. RAP steering committee held regular quarterly meetings at the project headquarters, and that 80 per cent of the members of the board of directors attended meetings regularly.

84. Recruitment of international technical assistance. RAP management recruited a qualified international consulting firm for one year starting December 2013. This contract was amended four times and the contract extended to the end of April 2016.

85. Recruitment of national technical assistance. For national technical assistance, RAP management recruited qualified national consultants to carry out the planned studies but despite repeated recommendations in a number of supervision missions refrained from recruiting a qualified civil engineer in BDA for close follow-up and reporting to RAP management. The project senior management and IFAD differed on the modalities to recruit this advisory position; the former arguing it should be competitively recruited while IFAD believed it should be a secondment from the Government. Additionally, RAP management did not recruit a legal adviser to design a system of road tolls for road maintenance.

86. The staff affiliated with RAP were sufficient, including an M&E officer, an accountant, an administrative officer and others. RAP also made use of BIRD technical staff as both projects fall under BDA as lead executing agency. BIRD and RAP are sharing the same office space at BDA

premises in Rufa'a, with logistical support in the form of office equipment, administrative staff and drivers.

87. The mission found that the 2015 annual work plan and budget (AWPB), the 2015 M&E plan and the 2015 procurement plan were consistent with one another. However, the mission noted that, while the M&E unit is collecting data on key indicators, these data are left raw without a narrative write-up to interpret the data and report results, draw conclusions and generate recommendations. The 2015 procurement plan was found to meet the basic requirements. However, the procurement plan is currently not used as a monitoring tool to measure implementation performance against the initial planning.

88. The mission is of the opinion that the performance of the M&E unit is moderately satisfactory (4). The M&E system produced adequate and reliable information to monitor project implementation outputs. However, to make the system more useful for planning and decision-making, it is imperative that the collected data be rigorously analysed and the results presented in narrative reports to the management. The mission also discussed the sources of RIMS information and reached the conclusion that the information presented in the RIMS are reliable.

89. Development of appropriate manuals for construction and maintenance of rural roads. The consulting firm designed the required manuals for road construction and maintenance and submitted them to RAP management. However, no training on the manuals was provided by the consultants or any other party.

90. Supervision of the project by NHBA. The NHAB's role was limited to approving the designs prepared by the international consultant, with a negligible role in supervision.

91. Coordination with BIRD community. The coordination of RAP with BIRD communities is acceptable in the RAP project area as reported in the M&E reports.

### E.3. Quality of financial management

92. The mission reviewed the fiduciary aspects of the project by examining and verifying the financial and procurement files, documents and records available at the PMU. The project PMU is located at BDA premises in Rufa'a, Gezira State. The overall quality of financial management is rated as moderately satisfactory (4). The figures in table 2 below show that actual disbursements lag behind projected disbursements as presented in the design report. This reflects inefficiency in disbursement.

**Table 2: Projected disbursement and actual disbursement 2010-2015**

Year	Projected disbursement US\$		Actual disbursement US\$	Difference US\$
2010	2 420 000			-2 420 000
2011	6 970 000			-6 970 000
2012	3.220 000	Sept. 2012	800 000	-2 420 000
2013	340 000	Oct. 2013	4 784 935	4 444 935
2014	-	May 2014	504 065	504 065
2015	-	June 2015	2 946 672	2 946 672
2015	-	Dec. 2015	3 244 552	3 244 552
Total	12 950 000		12 281 244	668 756

93. **Organization and staffing.** The project has been managed and supported by the BDA core team (BDA Director, Financial Controller, M&E Officer, CD Officer, Natural Resource Management Officer and Administrative Officer). Arrangements for financial management were adequate up to project completion. The staff dedicated to RAP included one accountant with the required skills and experience, as well as an admin/logistics assistant. The BDA core team located at BDA headquarters fully supported RAP in their respective fields, as stipulated in the project appraisal. All the BDA team is also recruited on competitive basis. Organization and staffing is rated as satisfactory (5).

94. **Budgeting.** Project budgets were prepared annually by the project team and were reviewed and approved by IFAD. The budget was prepared at BDA headquarters by the project team in collaboration with BDA officers. The AWP/B was then approved by the BDA board of directors and submitted for approval by IFAD and the Government (Ministry of Finance). The process was required to be completed before the end of the year preceding the budget year. Budgeting is considered moderately satisfactory (4).

95. **Flow of funds and disbursement arrangements.** Project funds were provided from the IFAD financing, government counterpart fund and beneficiary contribution. The project opened and maintained two bank accounts: one in foreign currency (the special account) to receive and disburse the proceeds of IFAD financing, and the other in local currency as the project operating account. The special account received the initial deposit of foreign financing and subsequent reimbursements of project expenditure against foreign financing. The operating account was used for project disbursements from foreign and counterpart financing. The operating account was replenished with transfers from the foreign currency account and counterpart transfers. The beneficiary financing did not materialize, as it was intended to contribute to road maintenance after completion and use of the road, which did not take place. The flow of funds to meet project activities was considered to be smooth and did not experience bottlenecks. However, a point to be considered for future big civil works (e.g. road construction) projects could be to consider providing reasonable Initial Advance to the DA to meet large contractors invoices and minimise the use of direct payment method of disbursement. The flow of funds is considered satisfactory (5).

96. **Internal controls.** The project followed the BIRDP financial manual and adopted an adequate segregation of duties and authorization processes. Adequate controls were in place for approval, payment recording of expenditure transactions and custody of assets. The project also maintained a fixed assets register updated to December 2015 with a physical inventory check as of that date. Project assets (most of them at RAP construction sites, with few transferred to BIRDP) are all kept in custody of the BDA on the assumption that they will be utilised for completion of the Road construction works under the on-going BIRDP. Internal controls are rated moderately satisfactory (4).

97. **Accounting.** The project adopted an access based single entry accounting software, similar to the one used by other IFAD funded projects in Sudan. The system is capable of capturing expenditures for different sources of financing and of producing accounting journals, Statement Of Expenditures, withdrawal applications, special account reconciliations, interim financial reports and yearly financial statements. In addition, the system produced a register of contracts and contract monitoring reports. Back-ups of the system were kept on external removable hard disk, other computers and the internet. This system adequately served accounting and financial management needs as well as those of internal control. However, it is considered to be the best thing for the purpose. A recent market research carried out to obtain indicated the availability of a couple of providers of accounting and financial management software. The process currently on-going to obtain a software for the Livestock Marketing and Resilience Programme is expected uncover the whole spectrum of software available. The accounting system is rated satisfactory (5).

98. **Financial reporting and monitoring.** The project prepared and submitted annual financial reports. Quarterly reports were also prepared for the purpose of internally reviewing financial performance. These periodic reports were shared and discussed with project management as and when required on an ad-hoc basis. The financial records of the project are properly kept in files for final audit of the project and other subsequent reviews as may be required following provisions of the Financing Agreement. Financial reporting is considered moderately satisfactory (4).

99. **Disbursement.** Disbursement performance is considered moderately satisfactory (4). Disbursement of the RAP grant DSF-8051-SD as of 31 December 2015 was SDR 7,636,469, including the initial advance (representing 93.1 per cent of the grant amount). Without the initial advance, project disbursement for the same period was SDR 7,096,919, i.e. 86.5 per cent of the grant proceeds. Estimated project winding-up expenses are US\$1,385,745. Grant disbursement to project closure is expected to be 98.7 per cent. However, the physical delivery of the main project component (component 1, physical rehabilitation and construction) is considerably lagging behind the design. Additional financing should be tapped in order to have the road completed to design level.

100. **Counterpart funds.** The performance of the counterpart funds is satisfactory (5). As per project design, the government counterpart fund was used for payment of customs duties and taxes. The

Government met its obligations regarding customs duties on imported goods and taxes on local project procurement, including VAT exemptions on construction contracts. The project followed up with MoFEP to ensure a continuous flow of counterpart funding.

101. **Compliance with loan covenants.** Compliance with the grant covenants is considered moderately unsatisfactory (3). While most of the grant covenants were met, two were not. The CRF was not set up. Also, the Kassala and Gedarif state governments did not issue the required decrees to introduce road maintenance fees and a good governance framework, despite repeated recommendations by supervision missions.

102. **Audit.** Timeliness and quality of audits are considered moderately satisfactory (4). The audit report for fiscal year 2014 was issued with an unqualified opinion and was submitted on 26 June 2015 before the deadline. The auditors expressed an overall opinion on the financial statements and no separate opinions expressed on SOEs or the special account. Audit of the project financial statements for fiscal year 2015 has also been carried out timely, but still expressing opinion on the FS only and not providing separate opinion SOEs or the designate account. This issue needs to be discussed further by IFAD with the Sudan SAI. It would also be useful to provide the SAI teams involved in auditing IFAD financed projects on IFAD audit guidelines and requirements.

103. **Procurement.** Overall, the performance of procurement is considered to be moderately satisfactory (4). Procurement processes followed the same approach envisioned at project design, with the Central Coordination Unit (CCU) carrying out all procurement transactions by national competitive bidding (NCB) and international competitive bidding (ICB). Other procurement methods were managed at BDA.

104. **Procurement at the CCU level.** The 2015 procurement plan included two procurement transactions to be handled by CCU. Currently, the two procurement transactions have been tendered and finalized and respective goods received.

105. **Procurement at the BDA level.** At the BDA level, with support from the IFAD consultant, the project conducted procurement processes for five works and construction contracts to complete works on road construction where the original contractor had failed to deliver. Also, small shopping transactions have been carried out. Compliance with procurement requirements was evident in terms of proper methods of procurement being adopted and prior review requirements are fulfilled. Staff were assigned within BDA to carry out procurement responsibilities and an experienced short-term consultant backstopped the team as well.

106. **Procurement planning.** Preparation of the procurement plan improved significantly with the adoption of a format allowing for sensible procurement planning. The 2015 procurement plan was found to meet the basic requirements. However, the procurement plan was not used as a monitoring tool to measure implementation performance against the initial planning. Additionally, the plan was not updated to incorporate contracts awarded to five contractors to finish works on road construction where the original contractor had failed to deliver. Also, the data on the actual status of implementation of all planned procurement activities was not updated regularly.

107. **Contract register.** The mission reviewed the project register of contracts. The 2015 register of contracts was found to be up to date in terms of contracts awarded in that year. The mission noted that some local shopping transactions were not included as no contract was concluded for performance and delivery. However, the recommendation of the previous mission regarding the status of payment of contracts was adopted.

108. **The procurement filing system.** The archiving of the procurement documents left room for improvement. At BDA level, documentation for the procurement procedures was kept separately, but still needed to be properly filed, in line with good procurement practices, and kept in better archives for future reviews.

109. **Procurement post review.** As part of the mission activities, a procurement post review was carried out. The review observed that recommendations made by the previous mission regarding required documentation had been fully adopted, in line with good procurement practice.

110. **Project assets.** The project assets register provides details on the locations, purchase and book value of all assets. A physical inventory check was carried out by the project in January 2016, which ascertained the physical existence of the assets included in the assets register. The project

prepared a proposal for allocation of RAP assets for approval by BDA. The proposal is that all RAP assets be kept in BDA custody for use in completion of the unfinished sections of the road. This work will be financed from BIRDP loan proceeds and the proceeds of the additional financing to be requested for BIRDP.

#### E.4. Partners' performance

111. Stakeholders' performance was assessed against the role and responsibilities described in the project design for implementation arrangements.

##### 112. BDA

<b>Responsibility and mandate as per project design</b>	<b>Performance assessment</b>
As financier and lead agency, BDA, given its limited experience in steering rural infrastructure projects, was tasked to recruit a qualified consulting firm to manage contractors, synchronize the rural infrastructure progress made under RAP with the interventions in natural resources management and market development under BIRDP, and facilitate coordination between all stakeholders and especially with the two states and federal entities involved, to institutionalize the design and maintenance approach by setting up the CRF.	In practice, the BDA did not take an active role in following and monitoring the project activities. Having recruited a highly competent consulting firm, it relied almost entirely on this external expertise without adequate involvement in implementation. The previous mission's suggestion to recruit a civil engineer to be based at the consulting firm headquarters in Sitta Arab was not implemented. At the time of the mission, discussion around the establishment of the CRF seems to have just started, only two months before the rainy season and the first year's fees collection.

##### 113. The Gadaref and Kassala state MPPUs

<b>Responsibility and mandate as per project design</b>	<b>Performance assessment</b>
The MPPUs were responsible for adaptation of the road design to field realities, certification of contractor payments, and planning and supervision of road maintenance works. As an integral part of the scaling up and replication process, road department staff were to receive formal and on-the-job training to build their capacities in road planning, design, management, supervision and maintenance.	The MPPUs' original design was rejected by the consulting firm as it was incompatible with soil conditions. The MPPUs received training, considered satisfactory by management in supporting the ministries to build capacities. On-site job training proved useful in upgrading the states' engineers' supervision and monitoring capacities. Over the course of the project, however, the MPPUs slowly disengaged as working partners of BDA. This lack of sustained engagement will pose a significant risk to sustainability.

##### 114. NHBA

<b>Responsibility and mandate as per project design</b>	<b>Performance assessment</b>
The NHBA's role, as a national authority overseeing all national and inter-state road networks in Sudan, was to approve the design and carry out regular monitoring activities to assess the performance of the contractor and consulting firm, and to determine the added value of the spot improvement approach vis-à-vis conventional road construction methods.	NHBA's notorious absence from the project's implementation phase stood in the way of mainstreaming the spot improvement approach within government planning and replicating the approach in other similar contexts in Sudan.

##### 115. The consulting firm (SMC)

<b>Responsibility and mandate as per project design</b>	<b>Performance assessment</b>
The consultant was intended to play a comprehensive role in training and backstopping the MPPUs and communities, monitoring and supervising progress, and taking corrective measures accordingly as the daily interface between the client and the contractors.	The consultant rejected the original design presented by the MPPU of Gadaref state. It provided training to various stakeholders, whose satisfaction on content were high. Although contractors failed repeatedly to meet targets, the consultant maintained close interactions and monitored their activities on a daily basis. The consultant maintained a solid monitoring and recording system during the overall process.

## **E.5. Quality of supervision and implementation support**

116. IFAD supervision missions generally comprised multidisciplinary teams of professional experts who were very effective in monitoring all aspects of programme activities under the different components.

117. These missions provided instrumental technical recommendations to pick up the pace of implementation of project activities. IFAD missions also provided constructive suggestions for overcoming implementation constraints and guidance on appropriate actions to be taken.

118. IFAD followed up strongly on BDA actions taken in response to recommendations made by IFAD during each previous mission. IFAD was also very supportive and flexible in approving borrower requests for retendering the urgent works to allow full usage of the road.

119. The close and regular supervision and implementation support provided by IFAD contributed significantly to salvaging the project. Overall, IFAD's performance during the implementation of programme activities is rated satisfactory.

## **E.6. Project internal rate of return**

120. Methodology for estimating RAP benefits and impacts. The anticipated estimated benefits as a result of the implementation of RAP are: (i) a reduction of vehicle operating costs; (ii) reductions in travel time, leading to improved accessibility for the rural population, and a decrease in transport tariffs, leading to passenger travel cost savings; (iii) increased agricultural productivity as a result of improved agricultural practices such as terracing and improved agricultural inputs, and higher prices for commercial sales; (iv) increased access to services, including health, education and other facilities; and (v) increased opportunities for women with less of a domestic transport burden and small-scale trading<sup>5</sup>.

121. Construction and maintenance costs. The approach adopted for construction of the Butana rural access road was to provide funding for the improvement of certain sections of key roads to enable all-weather access to the key market of New Halfa and improved all-weather access to other markets through the construction of improvements to the main junctions. The strategy adopted for the Butana project was to concentrate on those sections of the priority roads that prevented vehicles and people from moving freely to and from their preferred markets. Investments were to be made in some parts of the rural access roads linking with existing or planned state and federal feeder roads. The construction costs of the two proposed roads in the Butana area – Es Subagh-Sitta Arab (77 km) and Es Subagh-Hueshib (70 km) – were the actual contractor price. Maintenance costs were estimated at 3 per cent of the construction costs, and were assumed to start in year three after completion of the road construction. Rehabilitation of the road was assumed to cost 15 per cent of the road construction cost, implemented every four years (see table 2 for details).

122. The approach adopted for economic analysis of RAP is based on aggregating the total benefits derived from savings in vehicle operating costs, improved agricultural productivity and market prices, passenger travel savings in time and transportation tariffs, benefits from women's small-scale trading and value added by increased access to education and health services. For the purpose of economic analysis, the study used two measures of project worth, namely the economic internal rate of return (EIRR) and the net present worth (NPW) / net present value (NPV) at a 12 per cent discount factor. Both are discounted measures of project worth. The EIRR is a very useful measure of project worth and used by international financing agencies to assess economic feasibility.

123. To calculate the EIRR and NPV, the net benefits stream is discounted over the project life (20 years). The estimated EIRR for RAP is 12 per cent and NPV at a 12 per cent discount factor is about US\$9,018,465.

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<sup>5</sup> For more details see appendix 10.

## F. Assessment of sustainability

124. Efforts to ensure institutional sustainability were undertaken by strengthening community organizations in villages near the road alignment (CDCs). The communities have commenced work on SWC measures to protect the future passable road from erosion and floods. The main drawback is the delay in establishing the road subcommittees in communities located along the road. Institutional sustainability is rated as moderately unsatisfactory (3).

125. Efforts to ensure social sustainability have been initiated, with the localities and communities undertaking to identify road alignment and SWC activities. This included community involvement in the construction and rehabilitation of terraces as part of the SWC works. Communities are also assisting in the resolution of conflicts arising from road construction. Completion of the roads will contribute to empowerment of the communities through improved livelihoods by increasing their mobility, access to markets and enabling them to gain social and economic benefits. The delay in construction may threaten these achievements. The mission rates the social sustainability at this stage as moderately satisfactory (4).

126. The mission noted that there is a commitment to establish the CRF. However; preparation of the draft by-laws has not yet begun and consequently the limited participation of beneficiaries will affect sustainability. The project management assumption behind involving them at a later stage of the project lies in that the road needed to be passable during the rainy season before forming the CRF. In the absence of CRF, the road will be managed by the Government. The road financial sustainability is rated moderately unsatisfactory (3).

127. Technical sustainability of the road is well ensured. The design and construction work are of the highest quality. In addition to the design and the supervision activities, the consultant implemented a training programme for state ministry technical staff and communities on SWC. The mission rated technical sustainability as moderately satisfactory (4).

128. Traditional gold mining in the Alsoubagh area is causing extensive damage such as deforestation, de-vegetation, erosion, watercourse silting and disrupted drainage patterns. Extensive damage of this type was observed near the Sitta Arab to Alsoubagh road. This situation could have a significant negative impact on the sustainability of the road if drainage does not follow the original design pattern, resulting in damage to the embankment and associated structures. The project is attempting to mitigate environmental damage in the area through efforts such as forestation. With regard to climate change, the SWC maintenance activities will make the roads resilient to flooding. The mission rates environmental sustainability at this stage as moderately unsatisfactory (3).

129. Effective community participation will enhance sustainability. Communities serviced by the road participated effectively in the selection of road alignment and in resolving problems that have arisen during construction, particularly those relating to ownership of agricultural land crossed by the road. Currently, these communities are the main source of the labour force for the contractors. The communities will play an important role during the operating and maintenance phase. The mission rates the role of the communities at this stage as moderately satisfactory (4).

## G. Lessons learned and knowledge generated

130. All lessons learned presented below are the products of the various interactions and discussions that the completion review mission had with stakeholders, from both the government and the private sector. Some lessons learned deal with engineering aspects and would need to be technically validated because they haven't been tested in the field. Overall, they are applicable in other context sharing similar demographic and bio-physical conditions.

131. The following overall lessons learned and recommendations are proposed to consolidate and sustain the results achieved by the Programme and guide the design of future integrated rural infrastructure development projects.

### *Cost Effective Rural Feeder Road Design*

132. **Overall lesson 1.** In context where partners have low monitoring and supervision capacity during the implementation of large rural infrastructure project, high technical specifications can lead to delay, cost escalation and significant financing gap.

133. **Overall recommendation 1.** In the future, IFAD should explore early in project design realistic and cost-effective alternatives to full stretch gravel large road with full embankment; including small/narrow road width which could be further upgraded if required.

#### *Procurement*

134. **Overall lessons 2.** The first advance payment, amounting to 35% of the value of contract in RAP, proved to put additional unforeseen risks on RAP operations.

135. **Overall recommendations 2.** The client should be very careful in providing reasonable advance to the contractor against the contract value as per IFAD policy and guidelines on advance payment. Smaller instalments linked to outputs progress are desirable.

#### *Financial Sustainability*

136. **Overall lesson 3.** The expansion of the consultancy contract and the implications stemming from the price escalation has jeopardised the project's financial sustainability.

137. **Overall recommendation 3.** Client should be cautious about expanding the scope of the consultancy contract. Clear guidelines and criteria needs to be developed regarding the exceptional circumstances under which it can be approved. Since international consultancy firm implies higher costs, the overall cost of the Consulting Firm could exceed 10% of the value of the civil work contract. In addition, arrangement for handling contractors claims should be specified at design stage, i.e. through provisions detailing the mandated inter-ministerial committee.

#### *Contract management of Large Engineering Contract*

138. **Overall lessons 4.** The large engineering contract falling under component 1, Physical Rehabilitation and Construction of Rural Roads, was not suitable in the given context where the number of qualified contractors are limited and characterised by prevailing low managerial skills and weak financial capacity.

139. **Overall recommendations 4.** A good practice emerging from the RAP experience relates to unpacking large road engineering contracts into smaller manageable contracts. Without compromising on the program logic, the quality and sustainability of the infrastructure, it has proven to ease follow-up. Future project should include it as a risk mitigation operational measure to improve implementation performance.

#### *Capacity building*

140. **Overall lessons 5.** Only one surveyor engineer, less than 15% of targeted beneficiaries of on the job training, continued working with the Consultancy firm throughout the project. The remaining trained MPPUs staff returned to their original duty stations after participating in the design phase and early stage of constructions supervision.

141. **Overall recommendations 5.** Capacity building imitative needs to be associated with safeguards ensuring the highest retention of trained skilled labour force.

#### *Monitoring & Implementation*

142. **Overall lessons 6.** Monitoring and quality assurance should not be left to a consultancy firm. In infrastructure project, the client should hire a qualified engineering staff on the site to act as a reporting and liaison staff.

143. **Overall recommendations 6.** BDA should appoint, without delay, a civil engineer, with the right qualifications to support the implementation and maintenance of the roads as well as watershed management.

#### *Replications & Scaling-Up of Innovations*

**Overall lesson 7.** Spots improvements are proving a successful, cost effective and efficient solution pending simple but rigorous soil type analysis are undertaken to confirm feasibility and their materialisation.

144. **Overall recommendation 7.** The spot improvement approach is a cost-effective alternative with high replicability potential in similar areas in the Butana or Sudan. A thorough assessment by the NHBA should be undertaken immediately after the first rainy season to test, validate and disseminate the results to stakeholders.



### *Sustainability*

145. **Overall lessons 8.** The delay in starting the construction operation has had negative implications on the progress of establishing the CRF, a core sustainability pillar for the maintenance of the road.

146. **Overall recommendations 8.** It is critical to address policy and institutional constraints in road maintenance arrangements in parallel to physical progress. Low physical outputs performance should not prevent engaging stakeholders. The BDA should expedite the recruitment of a Consultant, on short term basis, to design the road tolls system in collaboration with the localities. This action is still pending and should start immediately.

## **H. Conclusions and recommendations**

147. Passable roads during the rainy season will generate immediate and direct benefit streams to small producers and pastoralists by improving access to larger markets. Benefits from the crossings are already accruing to communities as seasonal wadi streams have become passable all year round. Additionally, the stream of benefits will also accrue to vehicle operators and women through better access to health centres and educational facilities. The activities under component two, including SWC interventions such as terraces and wind breaks have yielded positive tangible impact, including for agricultural production and productivity and are likely to continue after project closure given the direct individual benefits generated by their implementation in the farmers' fields. The benefits streams generated after project completion will certainly continue for a long period of time.

148. The government commitment to the project activities is manifest in its adequate allocation of the required local budget that kept the project running. The mission met with the ministers of MPPUs in Kassala and Gadaref, who expressed their thanks and appreciation to IFAD and BDA and pledged to provide all technical and financial support to maintain this road and link it with the national highway network.

149. The stakeholders were quite interested in this project as none of the individuals whose agricultural land or houses were affected by the road complained or asked for compensation, and were glad to contribute since the road served the whole community. The communities also expressed their interest and enthusiasm in participating in the road committees and shouldering future responsibilities assigned to them.

150. The road will definitely have a positive effect on natural vegetation cover, which used to be damaged by irregular truck routes after the rainy season. In addition, the implementation of SWC measures along the road will have a positive environmental impact, with tree planting along the roadside in addition to terraces and bunds to protect the road from water erosion.

151. The mission met with a number of farmers who expressed satisfaction and indicated that the road had improved access to their farms. Pastoralists indicated that they were less likely to lose part of their herd during the rainy season because they can now move closer to the road when they anticipate rain. Overall, the mission noted during its field visits that all men and women in the visited communities expressed deep gratitude to IFAD and BDA for this intervention.

152. The capacity of rural producers will be enhanced with improved exchange of knowledge and experience with other neighbouring farmers, in addition to farmers' access to inputs and appropriate agricultural technologies and extension services in New Halfa and the localities of Butana and Atbara river.

153. Construction of the road will have a positive impact on market access for Butana inhabitants, thus facilitating their exchange of products and commodities, as well as on access to social and health services. This will increase their incomes and subsequently improve their standard of living.



## Appendix 1: Terms of Reference of the completions review mission

### Background

1. The Rural Access Project (RAP) was approved in December 2009 with an IFAD DSF grant of US\$12.95 million and Government's contribution of US\$1.92 million. The Project entered into force in April 2010 and closed on the 31 December 2015.
2. The goal of the project is to improve access of the rural population in the central Butana region to markets and social services. RAP has been implemented by the Butana Development Agency (BDA) which also implements the on-going IFAD financed Butana Integrated Rural Development Project (BIRDP). The RAP comprises three main components, associated objectives and key expected results (KER).
  1. **Physical rehabilitation and construction of rural feeder roads**
    - a. KER: 144 km of rural roads in central Butana are upgraded and regularly maintained;
  2. **Capacity building and institutional development; and**
    - b. communities are trained to manage road tolls and to engage in labour-based maintenance contracts;
  3. **Project management**
    - c. state capacity is strengthened to plan, design, supervise, manage and maintain rural feeder roads using the spot improvement approach (i.e. improving only trouble spots that make the road impassable or dangerous).
3. The Project area covers the localities of Butana and River Atbara in Gadaref and Kassala States, respectively. Throughout the investment cycle, the RAP activities experienced a series of delays. At start-up, additional time were needed from the State Ministries of physical planning to finalize the road design. In addition, the project's assumptions on the approach (spot improvements and engineered natural surface) proved to be inaccurate. Subsequently, during implementation, low bid prices, poor management of work by contractors and currency devaluation further pushed the project to request two consecutive no-costs extension, and prevented meeting the project's planned milestones and interventions.
4. The mission will conduct its work with due regard to relevant documentation, including:
  - (a) Updated IFAD Project Completion Report (PCR) Guidelines and format.
  - (b) Appraisal Report/Mid-Term Review Report.
  - (c) Loan Agreement and Loan Amendment documents.
  - (d) Supervision, Implementation & Follow-up reports

### Detailed objectives and Outputs of the mission

5. The project completion mission will include travel to the project areas for 16 days, including the individual meetings with projects stakeholders and stakeholders' workshop, which is expected to be conducted in the BDA head office in Rufa'a. The mission will, in close cooperation with the PMU/Butana Development Agency (BDA) and projects counterpart, undertake: i) an assessment and economic analysis, economic rate of return of the impact of investments of the project in line with its development objectives; and ii) produce the PCR in accordance with the IFAD format (attached).
6. The PCR shall follow IFAD's guidelines for Project Completion and be guided by the methodological framework set out in the updated IFAD Project Completion Review Guidelines (October 2015). The overall objective of the completion review is to assess and document overall project implementation performance and the results achieved. This entails an assessment of programme impact including the evaluation criteria and domains described in the PCR guidelines: i) project performance (relevance, effectiveness, efficiency); ii) sustainability; iii) rural poverty impacts<sup>6</sup> and; iv) the additional applicable evaluation criteria<sup>7</sup>.

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<sup>6</sup>Households' incomes and assets; Human and social capital and empowerment; Food security; Agricultural productivity; Institutions and policies.

<sup>7</sup>Gender equity and women empowerment; Access to markets; Innovation; Potential for Scaling up Environment and natural resource management; Adaptation to climate change; Targeting and outreach.

7. The PCR should pay special attention in identifying the factors that influenced the capacity of the programme to achieve the expected results; in terms of programme output, objectives or impact). The PCR should analyse both success and shortcomings in order to draw lessons for the future. In this context, the mission is expected to:

- (a) assess the relevance of project interventions at the time of project design and in today's context;
- (b) prepare a factual review of the project implementation, including physical implementation achievements, financial expenditures and assess the effectiveness of project implementation, or the extent to which project objectives were met, and document the immediate results, especially from outputs to intermediate outcomes, of project interventions;
- (c) determine the (immediate) improvement on rural households' well-being; and estimate if and quantify how it translated into likely sustainable results along above mentioned impact domains, for direct and indirect beneficiaries;
- (d) review the project costs and benefits, analyses economic rate of return, financial progress and whether the use of project funds is commensurate with the attainment of physical progress and the timeliness of procurement and disbursement activities;
- (e) assess the efficiency of project organization and management, effectiveness of the M&E system and reporting mechanisms and the efficiency of the overall project implementation process;
- (f) indicate the overall successes and shortfalls encountered in the course of implementation;
- (g) assess the quality and impact of cooperation with implementing institutions and service providers; review partners' performance, including contractors ability and constraints to comply with terms of contracts; and provide recommendation for future (infrastructure/road construction) projects in Sudan in line with IFAD's mandate and financial model; review partnership and implementation modalities between stakeholders and IFAD;
- (h) identify and describe design and implementation constraints that have influenced project implementation, including technical, bureaucratic, managerial, organizational, institutional and socio-economic policy issues, in addition to other external factors unforeseen during design and how these have affected the project in terms of implementation delays and shortfalls, and impact on the beneficiaries; and assess how implementation support and supervision mission's recommendations addressed them;
- (i) assess degree of compliance with financing agreement;
- (j) assess the prospects of sustainability of project benefits beyond project completion;
- (k) encourage learning across the Sudan Portfolio by generating useful lessons from implementation that will help improve IFAD's or the Borrower's future program and designs; draw recommendations specifically addressing risks mitigation strategies in rural development investment with large infrastructure components;
- (l) evaluate the performance of the Sudanese authorities, IFAD and the BDA in the implementation of the project. The assessment should cover:
  - procurement of goods and services;
  - quality of supervision;
  - efficiency in loan administration;
  - ability to anticipate problems and extend implementation support;
  - adequacy of reporting, recommendations and effectiveness of follow-up on recommendations;
  - identify how this has affected project performance; and
- (m) draw lessons learned that may be relevant for future IFAD operations.

## Methodology

8. The IFAD Guidelines for Project Completion Review, dated October 2015 will be used to guide the work of the mission and preparation of the PCR.
9. The mission will use a mix of quantitative and qualitative tools in order to form an informed judgment on overall project performance and results. For transparency and accuracy purposes, it is important that the consultation with project stakeholders should be as large and inclusive as possible and the list of persons to be met by the mission will require careful consideration.
10. Primary sources of information will include project reports and documents (supervision reports, MTR report, progress reports, AWPB, etc.), M&E and MIS data (including RIMS data), any surveys or specific studies undertaken by the project (including impact survey), PMU and service providers' records and the records of the groups supported by the project. These sources will be used extensively in order to generate quantitative information on project results or estimate project efficiency.
11. In addition to primary sources of information, the mission will collect relevant data from secondary sources, such as national and local statistics, beneficiaries' communities, other donors' statistics, the civil society, private sector entities (traders associations, universities, etc.). These will be used mainly to breach information gaps on certain issues or to cross-examine the data generated from other sources.
12. In case sufficient or reliable impact data is not available, the mission should undertake a mini-survey while in the field in order to collect basic information from a small sample of respondents (to be selected using the most appropriate sampling method). To this end, a questionnaire should be developed before the field work starts.
13. In addition and in order to gather an in-depth understanding on certain issues, collect stakeholders' feedback and generate important insights, the mission will use a variety of qualitative tools, such as key informants' interviews, focus group discussions and rapid case studies. Before starting the field work, it is important that the mission dedicates sufficient time to prepare the necessary interview guides.
14. The method of direct observation and focus groups discussions will also be used by the mission. A large sample of project sites, or locations where project activities took place, will thus be visited in order to collect impressions and feelings, verify that reported interventions took place, confirm that they met expected quality standards and beneficiaries' needs, or to take note of the external context of project intervention. Selection of project sites will require careful consideration in order to avoid biases.
15. In order to strengthen the analysis and overcome the weaknesses, intrinsic biases and the problems that may be associated with a single method, the mission will "triangulate" all findings, combining methods and data sources in order to cross-examine initial findings.

## Assignments/Specific ToRs for mission members

16. The mission will be led by Mr. Hassan Damous, team leader and seconded by Mr. Mohamed Abdelatif; road specialist, and Mr. Yonas Mekonen; APO; ICO Sudan. Mr. El Fadul Ishag, Portfolio Support Officer, will carry out aspects related to financial management separately. In addition, the mission will include representatives from the Federal and State Ministries of Physical Planning & Finance and Economic Planning a. The detailed scope of work of the mission members is described below:
17. **Mr. Hassan Damous**, Team Leader, will carry out the completion mission for the above-mentioned project. During that period, you will undertake the following tasks:
  - (a) take the overall leading role for the assignments including the specific allocations of the tasks;
  - (b) provide guidance to the team members on the methodology and data requirements for assessing all impact and performance assessment domains (relevance, effectiveness, efficiency, sustainability, rural poverty impacts, and additional evaluation criteria as stated in the PCR guidelines) of the activities carried out under the project;
  - (c) Identified and analyse required data from existing project surveys (baseline, mid-term and completion and M&E system) and collect additional data if required;
  - (d) Support and provide guidance to the other team members / lead the review, assessment and evaluation of all project activities;

- (e) Assess project implementation modalities effectiveness, constraints and lessons learned with stakeholders involved; and project-level results measurement and monitoring and evaluation (M&E) system;
- (f) With the support of the civil work consultant, assess overall physical progress and achievement, sustainability of the project development objectives; development impacts for the target group for both direct and indirect beneficiaries;
- (g) Review and assess overall approaches and strategies to rural infrastructure in the Butana, including cost-benefit analysis vis-à-vis alternatives approaches;
- (h) Evaluate partnership and collaboration between the states and Federal government agencies, contractors and PMU/BDA;
- (i) to quantify Economic Rate of Return of the project based on actual costs and incremental benefits; and review the effectiveness of the M&E system and reporting mechanisms during project implementation;
- (j) Lead the write up of the project completion report following the IFAD template and adhering to PCR guideline requirements; consolidate and synthesize the contributions from the other mission member(s) into the final report with all mandatory appendices following the IFAD templates;
- (k) drawing on the inputs from the team members, produce a PCR8; this should be finalized 5 weeks<sup>9</sup> after the wrap-up meeting.

18. **Mr. Mohamed Abdelatif**, Deputy Team Leader, will carry out the completion mission for the above-mentioned project. During that period and under the overall guidance of the mission leader and IFAD staff, you will undertake the following tasks:

- (a) Review the background documents to gain in-depth information about the project;
- (b) Describe and assess physical progress, including infrastructure activities, main outputs and outcomes, delivery mechanisms and involvement of the beneficiaries and partners using both quantitative and qualitative indicators;
- (c) assess the adequacy of financial projections in the design in regard of the infrastructure activities;
- (d) assess the efficiency of the infrastructure related activities, comparing the financial resources made available by the project with the outputs, outcomes and impacts on the target group;
- (e) provide an overview of the outputs of the infrastructure related activities in comparison with the targets set out in the amended appraisal and the AWPBs throughout the course of implementation and describe the participation of the poor in such activities;
- (f) assess to what extent the objectives of the infrastructure related activities were/will be achieved and their direct economic effect on the target population livelihoods, e.g. in terms of inputs & market access;
- (g) assess the impact of the infrastructure activities on the target population in terms of their changes in their livelihoods, in particular to the impact on physical and financial assets, agriculture productivity, food security, environment and common resource base, human assets, social capital and empowerment, gender equality and empowerment, institutions and services and markets, where applicable;
- (h) assess the sustainability of the infrastructure related activities with due consideration to ownership, stakeholder interests, institutions, economic and financial incentives and safety, and the environment;
- (i) support the team leader in analysing the ways in which the infrastructure activities have affected the financial and economic revenue e.g. by means of supporting in the development of farm models specific for the infrastructure activities, collecting prices met by farmers etc.;
- (j) Develop the re-allocation matrix from BIRD required for completion of the rural roads works; propose quantified activities per categories (TA, grants) needed to complete key contracts; to

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<sup>8</sup>See annotated PCR outline for reference.

<sup>9</sup> Key submission milestones are described under the timeframe and deliverables section.

estimate financing gaps for completion of the RAP's key contracts based on savings and reallocation from BIRDP;

- (k) Support the development of the re-allocation matrix from BIRDP required for completion of the rural roads works; and
- (l) contribute to the write-up of the Completion Report and relevant Annexes<sup>10</sup> covering infrastructure activities, in accordance with detailed directions provided by the Team Leader.

19. **Mr. El-Fadul Ishag**, will be responsible for assessing the fiduciary aspects of the project, and more specifically, he will handle all matters related to the financial management arrangements of the project. For the detailed description of the tasks and procedures to be carried out, he will refer to the IFAD "Financial Management Assessment Guidelines". In particular, an assessment of the financial management of the project will be undertaken, which will be presented in a separate report (technical document of the mission report). Moreover he will be responsible for evaluating the financial performance (effectiveness and efficiency) of the project in terms of:

- (a) Review the efficiency of the project's financial management, highlighting any issues related to flow of funds, financial record keeping, and timely provision and quality of audit reports, taking note of any evidence of prevention of avoidable cost overrun or realization of cost savings;
- (b) review the results of the latest External Audit Report (including specifically the Management letter) to ascertain whether any issues raised by the auditor may deter the process of loan closing or any other issues related to the project closing;
- (c) review the functionality of the accounting system and the financial reporting system; where is required the preparation of consolidated financial statements, test the correctness/completeness of consolidations activities;
- (d) review sample Withdrawal Applications sent after the last supervision, and Statement of Expenditures to verify adequacy, completeness and validity of claims (the list of tested SOEs will be included in the technical document on fiduciary aspects);
- (e) review compliance with Financial Covenants;
  - Draw up the disbursement of the project by category, components, and financiers (Govt, IFAD, beneficiaries) and compare the disbursements to the forecast made in the design of the project in order to highlight any significant discrepancies compared to the initial estimates;
  - Assess the adequacy of the financial projections in the original project design, highlighting significant deviations from original estimates;
  - Review the project financing plan and assess the timeliness and adequacy of financing contributions (IFAD, government, and domestic funding), taking note of any significant revisions to the financing arrangements and amendment to the loan agreement approved during the project life.
- (f) Closely review and monitor with the PMU the Procurement Plan to ensure that only contracts executed by project completion date are paid;
  - Ensure that procurement files are complete and obtain missing documents from project;
  - The verification of the terms of the contracts awarded and the commitments and disbursements made and obtain copies of approved contracts not yet submitted to IFAD;
  - Review the project assets: specifically check whether an allocation plan of project fixed assets has been developed by the project. Check if a property inventory was made and if its valuation was made in the financial statements of the project;
  - review the cash flow plan for the project until the closure date and the related recovery plan. Check the correct application of the plan by the PMU and/or analyse the impact of possible cash flow stress on completion and closing activities and make recommendations;
  - Assist the PMU in making an estimation of winding-up expenditures, including salaries and allowances of key project staff, operating costs, project completion report costs and final impact assessment study if applicable, and final audit report fees.

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<sup>10</sup> See annotated PCR outline for reference.

- (g) Check whether suitable arrangements have been made for archiving and document retention of the project (for the next ten years, as provided by general conditions);
- (h) Review actions taken to address recommendations of previous years supervision missions, recommendations raised by external auditors on previous year(s) management letters;
- (i) Report on lessons learned in terms of financial management and make recommendations for future projects;
- (j) contribute to the write-up of the Completion Report<sup>11</sup> and relevant Annexes covering project financial management and fiduciary aspects.

20. **Mr. Yonas Mekonen**, will be responsible for the coordination of the mission in collaboration with the Team Leader and the RAP project director and team. Additionally, he will:

- (a) Review and assess the project target group strategy, overall targeting effectiveness and outreach;
- (b) Collect and describe innovation, and assess replication potential and scaling-up pathways, by the GoS, communities and/or other stakeholders;
- (c) Review the partnership model used to deliver, including partners' performance;
- (d) Draw lessons for future operation and assess the project's capacity to manage and generate knowledge;
- (e) presents the initial, or amended, project Logical framework as included in the Project Design Document of the Mid-Term Review report;
- (f) compile the main conclusions of the stakeholders' PCR mission's findings workshop;
- (g) contribute to the write-up of the Completion Report<sup>12</sup> and relevant Annexes<sup>13</sup>.

#### **Timeframe and deliverables**

21. The mission will take place from **22 March to 6 April**. The in-country work will start with the briefing of the completion review team by the IFAD Country Office, to be held on **22 March**. The field work will take place from **23 March to 6 April**, following the detailed programme and itinerary that will be finalized at the start of the mission based on the tentative programme presented in these TOR.

22. Towards the end of the in-country work, the mission will present its initial findings and conclusions summarized in an aid-memoire during a wrap-up meeting to be hosted by the Ministry of Finance and Economic Planning.

23. The first draft PCR will be prepared shortly after the end of the completion review mission and submitted electronically by the mission's Team Leader to IFAD not later than **17 April**. The draft PCR report will be circulated among main stakeholders for review and consolidated, written comments will be sent to the mission's Team Leader not later than **30 April** by IFAD. On this basis, the final PCR report will be finalized and submitted electronically by the mission's Team Leader not later than **15 May** to IFAD.

#### **Deliverables Format**

24. The PCR will follow the template included in the PCR guidelines dated October 2015. The aide memoire at the end of the field mission will follow the regular format for aide memoire that is used by IFAD. All documents must be provided to IFAD in the appropriate templates provided by the Hiring Manager through the programme assistant, in English, and in an electronic format (Word/Excel) for future use.

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<sup>11</sup> See annotated PCR outline for reference.

<sup>12</sup> See annotated PCR outline for reference.

<sup>13</sup> See annotated PCR outline for reference.



## Appendix 2: List of person met and mission's programme

**Mission start up and meetings in Khartoum.** On 22 March 2016, the PCR mission was briefed by Mr. Hani El Sadani, the IFAD Sudan Country Program Manager, to discuss the field program. On 23 March the mission, joined by the Director of the Central Coordination Unit (CCU) for IFAD co-funded, Mohamed ElHag, met with Ms. Iqbal Abdul Magid, Director General of International Cooperation at the Ministry of Agriculture & Forestry (MoAF). The same day, the mission met with Mr. Awad Hussien, Deputy Director for International Cooperation at the Ministry of Finance & National Economy (MoFNE).

**Travel to project area.** On 24 March, the mission travelled to Rufa'a, HQ of the Butana Development Agency (BDA), RAP lead implementing agency. The mission met with the project implementation team who briefed the mission on the implementation status of the different project's components. During 25-28 March, the mission stayed in the BDA HQ to review available project document and gather qualitative information.

**Field Visits.** On 29 March, the mission travelled to El Subagh. The mission met with the commissioner of the Butana locality and members of the legislative assembly with the objective to better understand the role of the locality and its cooperation with RAP project management. The mission visited Al Foul community on the El Subagh-Hueshib road to discuss with benefited community the impact of the road and their role in relation to the road. On 30 March, the mission visited El Sadda community on Es Subagh-Sitta Arab stretch road, providing the mission with another opportunity to appraise communities' perception viz the benefits of the road, their role during the construction and the future maintenance. Additionally, the mission met with the Chief Consultant and his Deputy (SMEC) in Sitta Arab who briefed the mission on the progress under each of the six ongoing contracts.

On 31 March, the mission visited Al Rataga livestock market and talked with the contractor of the livestock market. The contractor bid for the management and collection of fees on marketed animals. Currently, the collected fees are not directed towards the road maintenance fund. Subsequently, the mission met with commissioner of Atbara river locality, Mr. Adam Kaloal, and discussed the role of the locality and their cooperation with project management.

On 1 April the mission travelled to Kassala and met with H.E. the Minister of Physical Planning and Public Utility and staff from the road department. The discussion focused on the role of the MPPU in the completion of the road from Sitta Arab to New Halfa; the Minister promised to explore options to finance the road from the East Development Fund as well as the Federal government. On 2 April, the mission travelled to Gadaref to meet with H.E. the Minister of the MPPU and the staff of the road department in Gadaref state. The discussion focused on the status and completion of the road Gadaref-Keradas -Hueshib. The Minister informed the mission that considerable budget had been allocated to pursue the construction of the remaining sections.

**Stakeholders' workshop & Write-Up.** The mission returned to Rufa'a on 3 April to prepare the organization of the stakeholder workshop scheduled to take place on 4 April 4. The workshop was attended by about 40 stakeholders, including representatives from the benefiting communities, the contractors and representatives from the MPPUs.

### List of persons met during the PCR Mission

Name	Responsibility
Mr. Mohamed Sir El Katim	Director; CCU; MoA&F
Ms. Iqbal Abdelmagid	Director General; International Cooperation; MoA&F
Mr. Hussien Awad	Deputy Director; International Cooperation ; MoFNE
Mr. Rashid Musa'ad	Director; BDA
Yassin Doleeb	Head; M&E Unit; BDA
Aida Osman	Community Dev. Officer; BDA
Mr. Emam Hussien	SMEC Chief Consultant
Mr. Hussien Hassan Miywah	SMEC Deputy Consulting firm
Mr. Abul Hafez Ataya	Chairman; HEWA for water drilling
Eng. Abu Baker Mohamed	Eng.; HEWA Contractor
Eng. Yousif Ali El Rayeh	Eng.; Shiryani Al Shamal Contractor
Eng. Ibrahim Ali Rageb	Eng.; Shiryani Al Shamal Contractor
Eng. Suliman Abu Baker	Eng.; Sayed Abdlla Sayed Contractor
Mr. Kamal Ga'afer	Minister; MPPU; Kassala state
Eng. Kamal Al Zain	Director of Road Dept.; Kassala state
Mr. Ali M. Hamad El Neil	Minister; MPPUs; Gadaref state
Mr. Rodwan Abdel lateef	Director; Road Dept. Gadaref state
Ms. Mahasin Abdel Rahman	Eng.; Road Dept. Gadaref state
Mr. Osman Ibrahim Suliman	Eng.; Road Dep. Gadaref state
Mr. Osman Mohamed Ahmed	Commissioner; Butana Locality
Mr. Adam Kaloal	Commissioner; River Atbara locality
Mr. Mohamed A. Al Mardi	Chairman; Legislative Assembly; Kassala State
Ms. Manal Taha	Deputy Chairman; Legislative Assembly; Kassala state
Mr. Mohamed Al Kalifa	Head of public committee Al Subagh
Mr. Mahmoud Awad Mekki	RAP Socio economic study Consultant

## Appendix 3: PCR rating matrix

<b>PROJECT NAME: Rural Access Project</b>	
<b>PROJECT ID: 1100001503</b>	
<b>BOARD APPROVAL DATE: 17/12/2009</b>	
<b>ENTRY INTO FORCE: 4/4/2010</b>	
<b>PROJECT COMPLETION DATE: 31/12/2015</b>	
<b>GRANT CLOSING DATE: 30/06/2016</b>	
<b>IFAD GRANT (USD MILLION): 12.95</b>	
<b>TOTAL PROJECT FINANCING: 14.96</b>	
<b>Criterion</b>	<b>PCR Rating</b>
<b>Project Performance</b>	
– Relevance	6
– Effectiveness	3
– Efficiency	3
– Sustainability	3
<b>Rural poverty impact</b>	
– Households' incomes and assets	4
– Human and social capital and empowerment	4
– Food security	4
– Agricultural productivity	3
– Institutions and policies	3
– <b>Overall rural poverty impact</b>	4
<b>Additional evaluation criteria</b>	
– Gender equity and women's empowerment	4
– Access to markets	3
– Innovation	3
– Potential for scaling up	3
– Environment and natural resource management	3
– Adaptation to climate change	3
– Targeting and outreach	4
<b>Partners performance</b>	
– IFAD's performance	4
– Government performance	3
<b>Overall project achievement:</b>	4

Rating score is out of 6 points. 6 is highly satisfactory, 5 is satisfactory, 4 is moderately satisfactory, 3 is moderately unsatisfactory, 2 is unsatisfactory and 1 is highly unsatisfactory



## Appendix 4: Project logical framework

### Logical Framework

Narrative Summary	Verifiable Indicators	Achieved	Means of Verification
<b>Goal</b>	▪	▪	▪
COSOP Goal: contribute to empower the rural poor to increase their food security, incomes and resilience to shocks	<ul style="list-style-type: none"> <li>▪ Increase of rural incomes from US\$500/ capita to US\$800/ capita</li> <li>▪ Reduction in the prevalence of malnutrition in children under 5</li> <li>▪ No. of households with improvement in household asset index</li> </ul>	<ul style="list-style-type: none"> <li>▪ Average per capita income increased to US\$3325</li> <li>▪ Overall weight for age changed from 25.1 % at benchmark to 19.8% at completion.</li> <li>▪ Height for age changed from 28.5% at benchmark to 21.6% on completion</li> <li>▪ Weight for height changed from 12.5% to 11.3% at completion</li> <li>▪ 66% of the targeted population show improvement in asset index</li> </ul>	<ul style="list-style-type: none"> <li>▪ Baseline survey of 2014</li> <li>▪ RIMS survey of 2015</li> </ul>
<b>Purpose/Objective</b>			▪
<b>Project objective:</b> Improve the socio-economic conditions of the rural population through increased rural road access to productive and social services, and to markets. <ul style="list-style-type: none"> <li>▪ Number of beneficiaries estd at 100 000 persons, in Butana area</li> </ul>	<ul style="list-style-type: none"> <li>▪ Increased producers' marketing margin by 10-20%;</li> <li>▪ Increase in number of women trading in the markets served by rural feeder roads. Target: 1700 additional women by project end.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Yes but this is not quantified</li> <li>▪ Women benefiting from trading were estimated to be 1,031</li> </ul>	<ul style="list-style-type: none"> <li>▪ Baseline survey and, mid-term review.</li> <li>▪ RIMS survey 2015</li> </ul>
<b>Outputs of the project</b>			
1) Access roads upgraded in Butana and Gash areas providing improved linkages to production areas, markets and services	<ul style="list-style-type: none"> <li>▪ A total 153 km improved in Butana</li> <li>▪ Number of producers benefiting from improved market access; (RIMS). Target: 15 000 producers</li> <li>▪ Increase in agricultural production marketed</li> <li>▪ Increase in farm gate prices by 25%</li> <li>▪ Increase in trips to markets (male/female)</li> <li>▪ Improved access to health services and schools</li> <li>▪ Decrease in transportation time by 20%</li> </ul>	<ul style="list-style-type: none"> <li>▪ Work in progress for improving 147 km</li> <li>▪ Number of household benefiting from improved market access is 8,831 household.</li> <li>▪ Agricultural production increased by about 20%</li> <li>▪ No data can support this finding</li> <li>▪ No data can support this finding</li> <li>▪ Yes but this not quantified</li> <li>▪ Transportation time decreased from 46 hrs to 1;45 hrs</li> <li>▪ Decrease in transportation cost by 40% to 50%</li> <li>▪ Vehicle operating cost decreased by around 35%</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project progress report</li> <li>▪ Impact survey data 2015</li> </ul>

Narrative Summary	Verifiable Indicators	Achieved	Means of Verification
	<ul style="list-style-type: none"> <li>▪ Decrease in transportation tariff in rainy season by 20%.</li> <li>▪ Decrease in vehicle operating costs by 20%.</li> <li>▪ Increase in road traffic (number and type of vehicles).</li> </ul>		
2) Communities are empowered to participate in the rehabilitation and maintenance of the roads.	<ul style="list-style-type: none"> <li>▪ A total of 153 km maintained annually</li> <li>▪ Community Road Fund established.</li> <li>▪ Community road fund annual disbursements are approx. US\$340 000.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Maintenance will start after the completion of roads under construction/</li> <li>▪ CRF is not established yet.</li> <li>▪ No money is collected under the CRF</li> </ul>	<ul style="list-style-type: none"> <li>▪ RIMS survey 2015</li> <li>▪ Project progress report</li> </ul>
3) State capacity strengthened to plan, supervise, manage, maintain and finance rural feeder roads	<ul style="list-style-type: none"> <li>▪ Infrastructure development plans exist at state level.</li> <li>▪ State budget allocation for infrastructure based on the development plan.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Yes at state level but RAP is not involved</li> <li>▪ RAP is not involved in this/</li> </ul>	<ul style="list-style-type: none"> <li>▪ RIMS survey 2015</li> <li>▪ Project progress report</li> </ul>
4) Project approach mainstreamed by NHA and the State Ministries of Planning and Public Utilities.	<ul style="list-style-type: none"> <li>▪ Training of the staff in these units.</li> <li>▪ Preventive maintenance implemented.</li> <li>▪ Decreased reliance on contractor pre-financing</li> </ul>	<ul style="list-style-type: none"> <li>▪ Training of engineers in the MPPUs of Kassala and Gedarif Total of 16 engineers</li> <li>▪ Preventive maintenance is not implemented as the road is not completed</li> <li>▪ Yes, the three contractors working now</li> </ul>	<ul style="list-style-type: none"> <li>▪ Consulting firm reports.</li> </ul>
<b>Activities of the project</b>			
1.1. Rehabilitation and construction of identified priority rural feeder roads in Butana area and the Gash Agriculture Scheme	<ul style="list-style-type: none"> <li>▪ Number of kms constructed/ rehabilitated annually</li> </ul>	<ul style="list-style-type: none"> <li>▪ Current construction is on the contracted civil work under component one</li> </ul>	
1.2. Implementation of conservation and water control works around the roads selected for rehabilitation/ construction	<ul style="list-style-type: none"> <li>▪ Number of conservation and water control works implemented annually</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project progress reports</li> </ul>	<ul style="list-style-type: none"> <li>▪ Good quality design works available</li> </ul>
1.3. Establishment of a community roads fund	<ul style="list-style-type: none"> <li>▪ Maintenance fund established with starting capital of US\$200 000 from project</li> </ul>	<ul style="list-style-type: none"> <li>▪ The maintenance fund has not been established yet</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project progress report</li> </ul>
2.1. Community participation in road works	<ul style="list-style-type: none"> <li>▪ Number of contracts established with community groups to carry out conservation and water control works</li> </ul>	<ul style="list-style-type: none"> <li>▪ This activity is implemented by individual farmers on their own farms</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project progress report</li> </ul>

Narrative Summary	Verifiable Indicators	Achieved	Means of Verification
<p>3.1. Capacity building of states through:</p> <ul style="list-style-type: none"> <li>- establishment of rural roads management units</li> <li>- training in selection and design of spot improvements, supervision and maintenance</li> <li>- Training on improved road maintenance</li> <li>- Planning, surveying and costing of priority roads.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Number of engineers deployed</li> <li>▪ Number of Rural Roads Committees formed</li> <li>▪ Number of vehicles procured</li> <li>▪ Number of offices rehabilitated and equipped</li> <li>▪ Number of persons trained</li> <li>▪ Types of training topics provided</li> <li>▪ % achievement of AWPB for the rural road</li> </ul>	<ul style="list-style-type: none"> <li>▪ In total 16 engineers were trained,</li> <li>▪ 17 village committee road formed</li> <li>▪ N/A</li> <li>▪ 2 offices rehabilitated for the consulting firm</li> <li>▪ engineers from MPPUs Kassala and Gadaref trained</li> <li>▪ Drawing, design, material testing, surveying</li> <li>▪ N/A</li> </ul>	
<p>4.1. Project management through:</p> <ul style="list-style-type: none"> <li>- recruitment of a civil engineer in BDA and PCU of the GSLRP</li> <li>- recruitment of national and international technical assistance</li> <li>- development of appropriate manuals for construction and maintenance of rural roads.</li> <li>- supervision of the project by NHA.</li> <li>- coordination with BIRD community based activities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Number of staff recruited</li> <li>▪ Number of TA mobilized and duration</li> <li>▪ Number of manuals developed by type</li> <li>▪ Type of decisions taken by NHA to replicate or mainstream project based on NHA supervision missions</li> <li>▪ Project disbursement</li> <li>▪ % achievement of project AWPB</li> <li>▪ IRR of the project is at least 30%</li> </ul>	<ul style="list-style-type: none"> <li>▪ PMU staff around 12</li> <li>▪ N/A</li> <li>▪ 2 manuals , one maintenance manual and another training on water and soil and water conservation</li> <li>▪ NABA role was limited to approval of design prepared by Consultant.</li> <li>▪ 93%</li> <li>▪ N/A</li> <li>▪ TBC during rainy season upon collection of realistic data</li> </ul>	<ul style="list-style-type: none"> <li>▪ Impact survey 2015</li> <li>▪ RIMS Data</li> </ul>





## Appendix 5: Dates of supervision mission and follow-up missions<sup>14</sup>

Type of Mission and date	Team Leader	Mission Composition
Supervision 5-16/8/2015	Hani Elsadani	Kamal El hadi, Mohamed Abdulatif, Procurement and Contracting, IFAD; Mohamed Abdul Mutaleb, MoAF
Supervision 28/6 – 6/7/2015	Hani Elsadani ▪	Ahmed Subahi, CPO, Deputy TL, Kamal El hadi, Civil Engineering NEN Consultant, and engineering, Fadul Ishag Procurement support CPO, Mohamed El Haj Sir El Katim senior coordinator CCU, Mohamed Abdelmutaleb MOA, Fatima Osman MFEP
Implementation 8-12/5/2015	Mohamed A. Lateef	▪
Implementation 28/11-10/12 /2014	Mohamed A. Lateef	▪
Supervision 22 – 28/6/2014	Hani Elsadani	Ahmed Subahi CPO, Deputy TL, Kamal El hadi, Civil Engineering EN Consultant, Fadul Ishag Procurement support CPO, Mohamed El Haj Sir El Katim senior coordinator CCU, Mohamed Abdelmutaleb MOA, Zahra Abdallah MFEP, Mr. Mohamed Elamin MOFEP
Implementation 25/5 – 30/5/2013	Kamal El Hadi	Kamal El Hadi
Implementation 16-20/4/2012	Mohamed Abdelgadir	Mohamed Abdelgadir
Supervision 1-26/9/2012	Rasha Omer ▪	Mr. Kamal Mohamed El Hadi, Civil Engineer and Mission Team Leader; Mr. Mekki Omer A/Latif SWC specialist, Mr. Ahmed Abusin, Community Development and Analysis Specialist; Ms. Wadzanai Katsande Financial Analyst; Ms. Isabelle Stordeur, Programme Assistant
Supervision 13-15/9/2011	Rasha Omer	Dr. Sayed Zaki, Institutional Development Expert; Ms. Hanneke Vermeulen Bouta, Associate Programme Officer; Mr. Omar Abdallah, Financial Management Expert; Mr. Mohamed El Haj, Senior Director of CCU Mr. Mohamed Abdelmotalieb, International Development Directorate, Ministry of Agriculture; Mr. Husham Osman, Economic Security Directorate, Ministry of Agriculture
11-28/7/2009	Sayed Zaki	Rasha Omer, CPM; An Anderson, IFAD Civil Engineer; Ms. Wadzanai Katsande, Financial Analyst; Mubark Mohamed MFEP and Mohamed Abdul Mutaleb MOAF

<sup>14</sup>BIRD supervision missions also touches on RAP issues



## **Appendix 6: Summary of amendments to the financing agreement**

A request for extension of DSF-8051-SD grant Programme Completion and Loan Closing Dates was requested and approved by PMD AVP on 24 June 2014.



## Appendix 7: Actual project costs

### Financial Performance by Financier in US\$ May 2011-December 2015

	Appraisal		Disbursement				% disbursed
	Original	Revised	actual	Under process	Initial deposit	Total disbursed	
IFAD	12,958,731	12,958,731	8,898,606	1,494,765	887,854	11,281,224	87.06%
Government	1,920,000	1,920,000	805,723	-	96,666	902,382	47.00%
Beneficiaries	90,000	90,000	-	-	-	-	
<b>Total</b>	<b>14,968,731</b>	<b>14,968,731</b>	<b>9,704,328</b>	<b>1,494,765</b>	<b>984,514</b>	<b>12,183,407</b>	<b>81.39%</b>



## Appendix 8: Budgeted amount and actual expenditures by financier

Category	Appraisal	Actual Expenditure (*)	Initial Deposit	Under Process (**)	Disbursement	Disbursement (%)
Civil Work	8,976,292	5,752,840		1,047,125	6,799,965	75.75%
Vehicles and Equipment	189,640	321,471		120,435	441,906	233.02%
Technical Assistance	2,022,826	2,587,794		257,284	2,845,078	140.65%
Recurrent Cost	339,772	251,764		42,922	294,686	86.73%
IFAD Financed Road Maintenance	134,328	11,735		-	11,735	8.74%
Unallocated	1,295,873	-			-	0.00%
Initial Deposit	-		887,854		887,854	0.00%
<b>Totals</b>	<b>12,958,731</b>	<b>8,925,605</b>	<b>887,854</b>	<b>1,467,766</b>	<b>11,281,224</b>	<b>87.06</b>

(\*) Actual expenditures replenished to SA or paid directly to suppliers/contractors

(\*\*) Expenditures for fiscal year 2015 claimed but not yet replenished or paid

**Financial Performance by Financier in Category (USD) May 2011 to 31 December 2015**

Category	Government				
	Appraisal	Actual Expenditure	Initial Deposit	Disbursement	Disbursement (%)
Civil Work	1,750,000	703,366		703,366	40.2%
Vehicles and Equipment	90,000	93,216		93,216	103.6%
Technical Assistance	-	4,411		4,411	0.0%
Recurrent Cost	80,000	4,729		4,729	5.9%
IFAD Financed Road Maintenance				-	0.0%
Unallocated				-	0.0%
Initial Deposit		96,660	-	96,660	0.0%
<b>Totals</b>	<b>1,920,000</b>	<b>902,382</b>	<b>-</b>	<b>902,382</b>	<b>47.00</b>

**Financial Performance by Financier Category (USD) May 2011 to 31 December 2015**

Category	Total		
	Appraisal US\$	Disbursement US\$	Disbursement (%)
Civil Work	10,726,292	7,503,332	70.0%
Vehicles and Equipment	279,640	535,123	191.4%
Technical Assistance	2,022,826	2,849,488	140.9%
Recurrent Cost	509,772	299,415	58.7%
IFAD Financed Road Maintenance	134,328	11,735	8.7%
Unallocated	1,295,873	-	0.0%
Initial Deposit	-	984,514	0.0%
<b>Totals</b>	<b>14,968,731</b>	<b>12,183,607</b>	<b>81.39</b>



## Appendix 9: RIMS data

### First level Results indicator

Total outreach	Unit	Ending AWPB	Actual Dec 2015	% of AWPB	Cumulative		
					appraisal	Actual 2015	% of appraisal
Households receiving project service	Number	5,000	5,307	108%	15,000	13,950	93%
Persons receiving project service	Male	21,249	16,865	79%	41,250	36,866	80%
Persons receiving project service	female	11,537	9,722	84%	33,750	31,935	95%
Persons receiving project service	Number	32,786	26,587	81%	75,000	68,801	91%
<b>Institutional Support</b>							
Govt. officials and staff trained	Male	0	0	0	48	19	40%
Govt. officials and staff trained	Female	0	0	0	16	4	25%
Govt. officials and staff trained	total	0	0	0	64	23	36%
Persons trained in infrastructure management	Male	0	0	0	15	11	75%
Persons trained in infrastructure management	Female	0	0	0	60	37	62%
Effectiveness of the promotion of poor policies & legislation	Rating	0	0	0	6	5	82%
Pro poor legislation and regulation enforced	Number	0	0	0	6	5	82%
Likelihood of sustainability of groups managing infrastructure formed and strengthened	Rating	0	0	0	6	4	67%
<b>Road / track</b>							
Groups managing infrastructure formed strengthened	Number	0	0	0	21	17	81%
Groups managing infrastructure with women in leadership	Number	0	0	0	21	17	81%
Land under improved management practice	Ha	2,421	2098	87%	6,900	6,277	91%
Persons in groups managing infrastructure formed / strengthened	Male				200	196	98%
Persons in groups managing infrastructure formed / strengthened	Female				200	150	75%
Groups managing infrastructure with women in leadership	Total				400	346	87%
Road constructed	km	32	32	100%	144	74	51%
Effectiveness; producers benefiting from access to market - livestock	rating	4	5	125%	6	5	83%
Likelihood sustainability of roads constructed	Rating	4	3	75%	6	3	50%
Road operating after 3 years	Km	70	70	100	144	74	51%
<b>Natural resource management</b>							
Land under improved management practices	Ha	4,421	2,098	87%	6,900	6,277	91%
Persons trained in natural resource management	Male				120	145	121%
Persons trained in natural resource management	Female				80	64	80%
Persons trained in natural resource management	total				200	209	105%
Effectiveness of NRM & conservation programmes	Rating	4	5	125%	6	5	83%
Effectiveness of improved land management practices and technology	Rating	4	5	125%	6	5	83%
Likelihood sustainability of improved land management practices and technology	rating	4	5	125%	6	5	83%

### Justifications for RIMS 2nd level indicators (RAP)

Component	Results
1. Physical Rehabilitation & Construction of Rural Feeder Roads	Likelihood of sustainability of roads constructed/rehabilitated
	Effectiveness: producers benefiting from improved access to markets
2. Capacity Building & Institutional Development	Likelihood of sustainability of groups managing infrastructure formed/strengthened
	Effectiveness of natural resources management and conservation programmes
3. Project Management	Effectiveness: improved performance of service providers
	Effectiveness: promotion of pro-poor policies and institutions

### Third level Indicators

Indicators	Unit	Benchmark	On Completion
Household with improved asset ownership	%	21.6	49.0
Underweight children weight for age	%	25.1	36.0
Chronic malnourished children height for age	%	28.5	44.0
Acute malnourished children weight for height	%	12.6	22.0
Household with access to improved water sources	%	67.0	67.0
Household with access to improved sanitation	%	1.7	1.7
Female household members who can read	%	42.0	49.0
Female household members who can read	%	58.0	66.0
Household experiencing one hungry season	%	36.0	8.2
Months duration of first hungry season	%	4.2	7.7
Household experiencing two hungry season	%	18.8	10.0
Months duration of two hungry season	%	1.1	6.3

## Appendix 10: Project internal rate of return (detailed analysis)

### Methodology for estimating RAP benefits and impacts

1. The anticipated estimated benefits are (i) lower vehicle operating costs; (ii) reductions in travel time leading to improved accessibility for the rural population, and a decrease in transport tariffs leading to passenger travel cost savings; (iii) increased agricultural productivity as a result of improved agricultural practices such as the use of terraces and improved agricultural inputs, and higher prices for commercial sales; (iv) better access to services such as health care and education; and (v) greater opportunities for women as they experience a decrease in their domestic transport burden and engage in small-scale trading.

#### Lower vehicle operating costs

2. The upgrading of roads in the Butana will tend to lower vehicle operating cost (VOC) of traffic currently using the road (normal traffic), providing more direct routes in the wet season. This will have a considerable impact on the cost of transport, reducing vehicle running costs components directly. It will also lead to a reduction in the vehicle fixed cost component indirectly, through better and effective vehicle use, leading to a reduction in VOC. The estimated benefit from lower VOC is obtained by multiplying the number of current and future projected vehicles by the VOC savings for each type of vehicle per km. The VOC saving per km is based on the estimates adopted in the project design report. Vehicles using the two constructed routes are estimated to increase annually by 2 per cent for heavy trucks, 3 per cent for Jumbos, 4 per cent for dafars, 5 per cent for minibuses and 6 per cent for pick-ups (see table 1 for a detailed calculation).

#### Reductions in travel time and transportation tariffs

3. The improvement of feeder roads in Butana area will lead to significant reductions in journey time, in addition to other benefits, including lower transport tariffs, more comfortable transport and improved services. These will induce the rural population to travel more frequently. The number of passengers will increase, and modes of travel will change because the rural population will no longer have to travel on the back of a truck but can use minibuses and passenger cars. The number of passengers travelling from each of the 22 communities each week is estimated at 10 passengers. Accordingly, the annual estimated travelling passengers are 520 passengers. The annual reduction in transportation cost is estimated at SDG 2,600 (i.e. SDG 5 per person per journey, multiplied by 520 journeys), equivalent to US\$419.00. The annual number of passengers travelling is projected to increase by 10 per cent (see table 1 for a detailed calculation).

#### Opportunities for agriculture / agricultural benefits

4. The improvement of rural and agricultural roads in Butana area will generate additional incomes for rural people due to an increase in agricultural production. The main assumption behind incremental productivity is based on the expansion of cultivated land under improved agricultural management practices. In particular, this will include using terracing technology for soil and water conservation, in addition to easy access to agricultural inputs at lower prices, leading to the extensive use of these inputs. Agricultural productivity is assumed to increase by about 20 per cent in the short term (1-2 years), 30 percent in the medium term (3-6 years) and 50 per cent in the long term (>6 years).

5. The cultivated agricultural land under improved agricultural practices in 2015 is estimated to be 6,277 feddans as per 2015 RIMIS survey. The increase in productivity is estimated at 1.08 sacks per feddan (i.e. 20 per cent of the average productivity of 5.4 sacks per feddan). Hence the total incremental productivity is 1.08 sacks multiplied by the total cultivated land under improved management practice (i.e.  $1.08 \times 6,277$  feddans = 6779 sacks). Accordingly, the incremental value of production is SDG 1796,447, equivalent to US\$289,750. (1 US\$= SDG 6.2).

6. In the medium term the land under improved management practices is estimated at 7,000 feddans and productivity is estimated to increase by 30 per cent (i.e. incremental productivity is  $0.3 \times 5.4 = 1.62$  sacks per feddan). Hence the total incremental production is 11,340 sacks (i.e.  $1.62 \times 7,000$  feddans) and the value of incremental production is SDG 3,005,100 (i.e.  $11,340 \times 265$ ), equivalent to US\$484,693.

In the long term, the land under improved management practices is estimated at 7,000 feddans and productivity is estimated to increase by 50 per cent. Hence the total incremental production is 18,900 sacks (i.e. 2.7x 7,000 feddans) and the value of incremental production is SDG 5,008,500 (i.e. 18,900 x265), equivalent to US\$807,822 (see table 1 for a detailed calculation).

### **Increased access to services such as health care and education**

#### ***Education***

7. At present there is little or no access to services such as health care, schools or social occasions during the rainy season in the Butana area. The lifetime earnings of educated versus uneducated samples provide an estimate of income differential. Assuming that improved access will enable only 20 and 30 students (girls and boys) to enrol in school and continue higher studies in Butana, the monthly salary will be around SDG 1,000 each and the average cost of education will be around SDG 200, thus the net annual income will be around SDG 9,600 (i.e. 800 x 12), equivalent to US\$1,548 for each and amounting to US\$77,400 for the 50 educated employees from Butana. The number of educated employees is anticipated to increase annually by about 10 per cent (see table 1 for a detailed calculation).

#### ***Health services***

8. Accessibility of health care can be assessed on the basis of a reduction in the number of work days lost through illness and other health savings such as reduced maternity and other deaths. Without road improvements, we may assume that during the rainy season there could be at least 20 cases of serious disease or pregnancy problem cases unable to travel to hospitals, costing the local communities about SDG 30,000 per person (i.e. SDG 100 per day x 300 working days a year), equivalent to US\$4,839 per person and equivalent to US\$96,780 annually for 20 persons. This number could increase annually by 2 per cent (see table 1 for a detailed calculation).

#### ***Benefits accruing to women from small-scale trading***

9. Based on the information collected from the 2015 RIMIS survey and the socio-economic study it is clear that many women would practice small-scale trading between their communities and nearby markets if they had access to easy travel. It is expected that more than 200 women (i.e. 10 from each community) will become active in trade due to road improvements. If each woman makes at least two trips per week (i.e. 104 trips a year) and generates a profit from domestic trade in the range of SDG 40 per trip, the additional income generated will be around SDG 832,000 (equivalent to US\$134,193). This would be partially attributable to the increase in the number of women and partially to the likely increase in profit (see table 1 for a detailed calculation).

#### ***Construction, maintenance and rehabilitation costs***

10. The approach adopted for construction of the Butana rural access road is to provide funding for the improvement of certain sections of key roads to enable all-weather access to the key market of New Halfa and improved all-weather access to other markets through the construction of improvements to the main junctions. The strategy adopted for the Butana project is to concentrate on those sections of the priority roads that currently prevent vehicles and people from moving freely to and from their preferred markets. Investments will be made in some parts of the rural access roads linking with existing or planned state and federal feeder roads. The construction cost of the two proposed roads in the Butana area - Es Subagh-Sitta Arab (77 km) and Es Subagh-Hueshub (70 km) is the actual contractor price. Maintenance costs are estimated at 3 per cent of the construction cost. Maintenance is assumed to start in year 3 after completion of the road construction. Road rehabilitation is assumed to cost 15 per cent of road construction and will be implemented every four years (see table 2 for details).

## Economic analysis

11. The approach adopted for the economic analysis of RAP is based on aggregating the total benefits derived from savings on vehicle operating costs, improved agricultural productivity and market prices, passenger travel savings in time and transportation tariffs, benefits from women's trading and value added from access to education and health care services. For the purpose of economic analysis, the study used two measures of project worth, namely the economic internal rate of return (EIRR) and the net present worth (NPW) / net present value (NPV) at 10 per cent discount factor. Both are discounted measures of project worth. The EIRR is a very useful measure of project worth used by international financing agencies to assess economic feasibility.

### EIRR and NPV at 12 per cent at design level and on completion date

Description	EIRR at 12% DF %	NPV at 12% DF US\$
As per project design	26%	8,066,345
As on project completion	12%	9,018,465

12. For calculations of EIRR and NPV, the net benefits stream is discounted over the project life (20 years). The estimated EIRR for RAP is 12 per cent and the NPV at 12 per cent discount factor is about US\$9,018,465 million (see table above).

**Table 3: Total stream of benefits derived or anticipated to be generated as a result of the implementation of RAP (US\$)**

	Passenger saving on traveling	Incremental agricultural benefits	Health benefits	Educational benefits	Women's trading	VOC savings Subagh - Sitta Arab	VOC savings Subagh - Hueshib	Total benefits
2015	419	289,750	96,780	77,400	134,193	1,604,054	760,523	2,962,700
2016	461	289,750	98,780	81,270	134,193	1,604,054	760,523	2,969,031
2017	507	289,750	100,690	85,333	134,193	1,637,988	775,753	3,024,214
2018	558	289,750	102,704	89,601	134,193	1,697,148	798,805	3,112,489
2019	613	484,693	104,758	94,080	134,193	1,754,314	822,224	3,396,970
2020	675	484,693	106,853	98,784	134,193	1,802,738	844,247	3,472,183
2021	742	484,693	108,990	103,723	134,193	1,851,172	866,236	3,549,749
2022	817	484,693	111,170	108,909	134,193	1,900,292	884,899	3,624,973
2023	898	484,693	113,393	114,355	136,877	1,949,419	911,897	3,711,532
2024	980	807,822	115,661	120,072	136,877	1,999,247	934,261	4,114,920
2025	988	807,822	117,974	126,076	136,877	2,054,951	952,274	4,189,962
2026	1087	807,822	120,333	132,380	136,877	2,110,545	974,936	4,283,980
2027	1195	807,822	122,740	138,999	136,877	2,166,895	997,600	4,372,128
2028	1315	807,822	125,195	145,949	139,614	2,229,282	1,020,902	4,470,079
2029	1446	807,822	127,699	153,247	139,614	2,293,311	1,039,554	4,562,693
2030	1591	807,822	130,253	160,909	139,614	2,359,093	1,066,915	4,666,197
2031	1750	807,822	142,858	168,954	139,614	2,431,869	1,090,807	4,783,674
2032	1925	807,822	135,515	177,402	139,614	2,498,366	1,119,397	4,880,041
2033	2118	807,822	138,225	186,272	139,614	2,573,236	1,152,637	4,999,924
2034	2330	807,822	140,990	195,586	139,614	2,648,911	1,185,878	5,121,131
2035	2562	807,822	143,810	205,365	139,614	2,730,203	1,215,106	5,244,482
2036	2819	807,822	146,686	215,633	139,614	2,823,372	1,245,310	5,381,256

**Table 4: Construction, maintenance, rehabilitation and total costs in US\$**

<b>Year</b>	<b>Construction cost</b>	<b>Under process</b>	<b>Maintenance</b>	<b>Rehabilitation</b>	<b>Total costs</b>
2012	800,000				800,000
2013	4,784,935,				4,784,935,
2014	504,065				504,065
2015	2,946,672	76,047			3,021,719
2016	3,244,552	1,047,124			4,291,676
2017					
2018			441,475		441,475
			441,475		441,475
			441,475	1,473,157	1,914,632
2014			441,475		441,475
					441,475

## **Appendix 11: Environmental assessment (detailed analysis)**

At appraisal, an environment and social review was undertaken. Beyond providing specific recommendations on the measures needed to be taken to mitigate the environmental impacts caused by the uncontrolled expansion of gold mining in the Butana, the completion mission did not deem relevant to undertake a specific ex-post environmental impact study of the road construction due the low physical progress.





## Appendix 12: Final stakeholder workshop findings

**Introduction.** The stakeholder workshop gathered all main project stakeholders to provide an opportunity to reflect and solicit views on key success factors and/or reasons for under-performance, key lessons learned, and key risks and key actions required in order to increase the likelihood of sustainability.

**Objectives.** Participants assessed:

- *Effects of the project on the intended beneficiaries*
- *Potential for sustainability*
- *Performance of project partners*
- *Extent to which the objectives and goals were achieved*

**Expected outputs.** A workshop report will be compiled by RAP presenting the main conclusions, findings and lessons learned from both plenary and group discussions. A draft version will be presented during the PCR wrap-up at the federal level.

Content	Resp.	Time
Opening and welcoming speech	BDA Director	11:00-11:10
Summary of RAP project completion mission findings	PCR Team leader	11:15-12:00
Introduction to stakeholder group discussions: - <i>Objectives and expected outputs</i>	PCR Team leader	12:00-12:15
Group discussions 1) Road maintenance 2) Community road funds 3) Road construction	<i>Group 1:</i> Ekhlas/Tessema/Yassin/Mohamed El-Hassan (moderator/facilitator/rapporteur) <i>Group 2:</i> Aida/Fatma (moderator/facilitator/rapporteur) <i>Group 3:</i> Mohamed Abdella / Moham M. (moderator/facilitator/rapporteur)	12:15-13:15
Coffee break	All	13:15-13:45
Group presentations	Designated group rapporteur (3 x10 min)	13:45-14:15
Plenary discussion	All	14:15-14:45

*Guiding questions for the group work discussion.*

### Group 1: Road maintenance

- What are the approaches available, responsibilities of each stakeholder, complementarities and coordination required with the proposed CRF to enable optimal road maintenance (i.e. preventive vs emergency contract)?
- How will labour-based maintenance contracts fit within the chosen approach?
- What capacity-building needs to be provided to communities to enable them to perform preventive maintenance?
- Other

### **Group 2: Community road fund**

- What are the perceptions of stakeholders on the community road fund?
- What are the steps required to achieve its establishment and subsequent formalization?
- How will it be funded, including operating costs?
- What alternative arrangements can be developed?
- Other

### **Group 3: Road construction**

- What is the relevance and cost-effectiveness of the spot improvement approach?
- Overall performance (strengths, weaknesses) of implementation partners:
- Butana Development Agency (BDA)
- State Ministry of Physical Planning and Public Utilities, Gadaref
- State Ministry of Physical Planning and Public Utilities, Kassala
- State Ministry of Agriculture and Irrigation, Gadaref
- State Ministry of Agriculture and Irrigation, Kassala
- National Highways and Bridges Authority (NHBA)
- Localities in Butana
- Localities in River Atbara
- Communities located along the road alignment, through the community-led road committee
- Contractors
- Consultants
- Communities' perceptions of delayed contracts

**Three groups were formed to address issues related to: (i) the community road fund; (ii) maintenance; and (iii) the sustainability of RAP infrastructure.**

#### **Group 1: Community Road Fund**

**Facilitator:** Fatima Osman Mohammed Ali and Ida Adam

#### **Overview of discussions**

The discussion focused mainly on the current situation and how to maintain sustainability of RAP in the future. The discussions centred around three main axes: the main source of funding, modalities for fees collection, and the required legislation to guarantee financial resources allocation to the road committees and community mobilization in order to ensure the effectiveness of the community road fund.

## Conclusions/Agreements

The following were the main agreed actions emerging from the discussion during the session:

- **Perceptions of stakeholders on the community road fund**
  - Setting up such a fund remains of great importance to ensure road sustainability;
  - Community ownership is crucial; to this end community mobilization should be undertaken along with capacity-building.
- **Steps required to set up the CRF**
  - A committee was established in each beneficiary village for representation on the higher committee;
  - Identify the main tasks and functions of the legal committee;
  - Follow up with the state governors to issue a decree establishing the CRF committee in each concerned community;
  - Liaise with legislative councils in the states to determine modalities for collecting fees
- **Funding and operating costs**
  - Collecting fees from road users as a contribution;
  - Imposing fees on livestock sales, e.g. SDG 1 per head;
  - Collecting contributions from localities;
  - Attracting more external funds from organizations and other funds to complete the remaining activities, including tarmac;
  - Collecting contributions from farmers.

## Alternative arrangements

- Taking steps to establish a tarmac road as a national road under the National Highways and Bridges Authority (NHBA) in the future to address sustainability;
- Coordination with road committees and NHBA to ensure an effective role for the maintenance unit.

## Group 2: Maintenance

The following were the main action points emerging from discussions during the session:

Theme	Agreed actions
1. Role and responsibilities of the committees in maintenance	- Simple maintenance - Completion of the proposed number of committee roads - Create incentives.
2. Maintenance type	- Routine maintenance: simple maintenance, embankments, stabilizing banks - Periodic maintenance by localities
3. Training courses needed by communities and engineers to fulfil maintenance work	Training on simple maintenance, raising awareness of the importance of the road; road project management training, advanced courses for engineers
4. Other alternatives for maintenance	The request to complete the road and make it Asphalt, Benefit from the Butana camp, Include complete road and Asphalt, Rebuilding the East Development Fund

### **Group 3: Road construction**

- **Substantive improvements and suitability to the conditions of the region**
  - In terms of design, consider suitability of the interventions beforehand;
  - Undertake cost-benefits analysis to respond to field realities.
  
- **Role of the Ministry of Physical Planning and localities and communities**
  - Technical expertise and quality assurance with several engineers of various specializations;
  - In parallel, communities should play an active and significant role in helping to open the track route without claiming compensation for crossing their land;
  - Avoid obstructing contractor work on the Es Subagh-Sutta Arab stretch of road;
  - Localities should contribute to solving emerging problems.
  
- **Re-evaluating the performance of contractors**
  - Weak contractors have caused significant delays for a wide array of reasons, including: lack of vehicles and equipment, poor management and a limited understanding of bio-physical constraints, i.e. water availability.

## Appendix 13: Final wrap-up meeting minutes

The main issues discussed at the wrap-up meeting were as follows:

The meeting opened with a speech by Mr Omer El Haj, who talked about the strong partnership between the Government of Sudan and IFAD. He also talked at length about IFAD's continuous support for Sudan's development efforts targeting rural poor women and men in particular.

The floor was then given to the team leader for a brief presentation on the findings and lesson learned from RAP implementation. The team leader gave a PowerPoint presentation and opened the floor for comments and questions.

The floor was then given to Mr Rashid Mussad, RAP manager, to comment on the aide-memoire and the presentation by the team leader. He indicated that all the point he had sent to the team leader were reflected in the final report.

He also reiterated his scepticism regarding the rating on the project management at moderately unsatisfactory. After an exchange of views, the participants and the TL agreed to maintain it.

Mr Subahi stated that RAP sustainability was a crucial issue that needed to be addressed by project management, in particular the fact that the CRF had not yet been created, and indicated that if established it would need to be sufficient to cover maintenance costs. Since establishing the CRF will take time and given the imminent project's closure by the end of June, proposals and alternatives to address this critical issue should come from the RAP Manager together with the RAP board of Directors; the sustainability of the road is at stake.

The participants had a lengthy discussion on the financing gap, which would amount to about US\$5.35 million. The project manager was asked to take the matter very seriously and consider the issue together with IFAD and the Ministry of Finance (MFEP).

The wrap-up meeting was held on 9 June at MFEP.

The meeting started at 13.00 and ended at 14:30.

The meeting was attended by:

Mr Omer Mohamed Ahmed El Haj	Director of International Cooperation
Mr Sayed Hamdani	Manager of Foreign Finance
Mr Ahmed Subahi	CPO IFAD office, Sudan
Mr Al Fadul Ishag	CPO IFAD office, Sudan
Ms Mia Madsen	CPO IFAD Office, Sudan
Mr Mohamed El Haj Sir Elkhatim	Director, CCU
Ms Ekhlad Alemairy	Officer, CCU
Rashid Abdelaziz Mussad	RAP project manager
Fatima Osman	IFAD desk officer, MFEP
Hassn Damous	Team leader for preparation of RAP PCR