Using modern technologies in the design of small- scale irrigation schemes and in their monitoring and evaluation (马里)

Application des technologies modernes dans la conception des aménagements hydroagricoles et leur suivi & évaluation (French)

描述

Applying modern technologies in the design, monitoring and evaluation of village irrigation schemes (VISs) and floodplain depression ponds.

This practice involves applying modern technologies in the design, monitoring and evaluation of village irrigation schemes (VISs) and floodplain depression ponds.
To summarise, it involves the following technologies and procedures: 1) The application of total stations for topographical studies, which enables: the creation of a digital model of the study area to facilitate the study of topographical characteristics, differences in levels, depressions, mounds, etc.; georeferencing, which makes it possible to integrate the site and the proposed design into a geographic information system (GIS). This means other information sources like satellite imagery and aerial photography become available for use in the analysis. 2) The use of a high-precision global positioning system (GPS) for installation works. Once the scheme's study and design are approved, the use of high-precision GPS means that work to install the scheme will be particularly precise and will adhere to the irrigation and drainage network configuration as designed and approved in the scheme studies. 3) The use of georeferenced photography for monitoring and inspection. The programme has begun using georeferenced photographs to enable teams to inspect and supervise installations in situations where conditions for accessing sites are unfavourable. These photographs show the installations and display the data recorded for each shot, allowing dates and locations to be checked. 4) The use of satellite imagery (Landsat). A primary application of Landsat is to monitor and evaluate the farming activities of sites. Using the images, the value of the normalised difference vegetation index (NDVI) can be determined. With this indicator, it is possible to verify in which areas VISs are operational. Furthermore, the Landsat images improve analyses during the design stage, providing information on specific events such as heavy flooding or very low water levels.
A high-quality scheme is a prerequisite for making water management efficient and reducing production costs. Landsat: One important impact/effect was that the consultant on site was able to persuade donors of the feasibility of carrying out minimum-level monitoring despite the difficult security situation. This was crucial as the donors were faced with a difficult choice: on the one hand, the lack of security made it impossible to access the zone in order to carry out monitoring and supervision missions, which seriously threatened the continuity of the programme; on the other hand, donors were obviously very sensitive to the plight of the communities suffering occupation and armed conflict. Total stations and GPS: These two technologies allow users to ascertain the specific features of sites more accurately than is possible with 'traditional' approaches, which are more basic and less refined. The technologies enable the design of good-quality schemes by facilitating water management. It is important to highlight the fact that a good-quality irrigation scheme (which is well configured and laid out in terms of its irrigation network and facilities) reduces production

地点

地点: Bamako, Mali , 马里

选定地点的地理参考

- 不适用

启动日期: 2011

终止年份: 不适用

方法的类型

- ☐ 传统/本土
- ☐ 最近的本地倡议/创新
- ☑ 基于项目/方案

costs (less pumping time needed).
Currently, only PMN/IPRODI are using this practice. The planning service providers were given introductory training on applying the technologies and set themselves up to provide sufficient data in their invoices and reports to allow coordinators to apply the modern technologies. The programme's coordination team is ready to share these technologies with its partners and has already delivered presentations to parties expressing an interest

方法目标和有利环境

该方法的主要目的/目标

Applying modern technologies in the design, monitoring and evaluation of village irrigation schemes (VISs) and floodplain depression ponds; the technologies enable the design of good-quality schemes by facilitating water management; a good-quality irrigation scheme (which is well configured and laid out in terms of its irrigation network and facilities) reduces production costs (less pumping time needed); feasibility of carrying out minimum-level monitoring despite the difficult security situation
The SLM Approach addressed the following problems: low quality schemes; lack of minimum-level monitoring due to the difficult security situation; water management problems;

推动实施本办法所应用技术的条件

阻碍实施本办法所应用技术的条件

- **了解SLM，获得技术支持**: lack of minimum-level monitoring due to the difficult security situation; water management problems; Treatment through the SLM Approach: These technologies allow users to ascertain the specific features of sites more accurately than is possible with 'traditional' approaches, which are more basic and less refined. The technologies enable the design of good-quality schemes by facilitating water management. Feasibility of carrying out minimum-level monitoring despite the difficult security situation

相关利益相关者的参与和角色

该方法涉及的利益相关者及其职责

该方法涉及哪些利益相关者/执行机构？	指定利益相关者	说明利益相关者的角色
SLM专家/农业顾问		
国家政府（规划者、决策者）		
国际组织		

当地土地使用者/当地社区参与该方法的不同阶段

	无	被动	外部支持	互动	自我动员
启动/动机		✓			
计划		✓			
实施				✓	
监测/评估		✓			
Research		✓			

流程图

有关SLM技术选择的决策

决策是由……做出的
- 仅限土地使用者（自主）
- 主要是土地使用者，由SLM专家提供支持
- 所有相关参与者，作为参与式方法的一部分
- 主要是SLM专家，咨询土地使用者之后
- ✓ 仅限SLM专家
- 政治家和领袖

决策是基于
- 对充分记录的SLM知识进行评估（基于证据的决策）
- 研究结果
- 个人经验和意见（无记录）

技术支持、能力建设和知识管理

以下活动或服务是该方法的一部分
- ✓ 能力建设/培训
- ✓ 咨询服务
- ✓ 机构强化（组织发展）
- ✓ 监测和评估
- ✓ 研究

能力建设/培训

向以下利益相关者提供培训

- [ ] 土地使用者
- [x] 现场工作人员/顾问

培训形式

- [ ] 在职
- [ ] 农民对农民
- [ ] 示范区域
- [ ] 公开会议
- [x] 课程

涵盖的主题

Currently, only PMN/IPRODI are using this practice. The planning service providers were given introductory training on applying the technologies and set themselves up to provide sufficient data in their invoices and reports to allow coordinators to apply the modern technologies.

咨询服务

已提供咨询服务

- [ ] 在土地使用者的土地上
- [ ] 在固定中心

Currently, only PMN/IPRODI are using this practice. The planning service providers were given introductory training on applying the technologies and set themselves up to provide sufficient data in their invoices and reports to allow coordinators to apply the modern technologies.

机构强化

机构已强化/建立

- [ ] 否
- [x] 是，少许
- [ ] 是，适度
- [ ] 是，非常

在下述层面上

- [x] 本地
- [ ] 区域
- [ ] 国家

描述机构、角色和职责、成员等.

支持类型

- [ ] 财务
- [x] 能力建设/培训
- [ ] 设备

进一步细节

监测和评估

technical aspects were regular monitored by project staff through observations

研究

研究涉及以下主题

- [ ] 社会学
- [ ] 经济/市场营销
- [ ] 生态学
- [x] 技术

融资和外部物质支持

SLM组成部分的年度预算，以美元计算

- [ ] < 2,000
- [ ] 2,000-10,000
- [ ] 10,000-100,000
- [ ] 100,000-1,000,000
- [ ] > 1,000,000

Approach costs were met by the following donors: international: 100.0%

Precise annual budget: 不适用

已向土地使用者提供以下服务或激励

- [x] 为土地使用者提供财政/物质支援
- [ ] 特定投入的补贴
- [ ] 信用
- [ ] 其它激励或手段

为土地使用者提供财政/物质支援

影响分析和结论性陈述

方法的影响

	否	是，很少	是，中等	是，支持力度很大
该方法是否帮助土地使用者实施和维护SLM技术？ the effects of successfully deploying these technologies contribute to creating good-quality schemes with few water management problems and moderate production and maintenance costs			✓	
该方法是否有助于社会和经济弱势群体？			✓	
Did other land users / projects adopt the Approach? Currently, only PMN/IPRODI are using this practice. The planning service providers were given introductory training on applying the technologies and set themselves up to provide sufficient data in their invoices and reports to allow coordinators to apply the modern technologies. The programme's coordination team is ready to share these technologies with its partners and has already delivered presentations to parties expressing an interest	✓			

土地使用者实施SLM的主要动机

- [x] 增加生产
- [ ] 增加利润（能力），提高成本效益比
- [ ] 减少土地退化
- [ ] 降低灾害风险
- [ ] 减少工作量
- [ ] 支付/补贴

方法活动的可持续性

土地使用者能否维持通过该方法实施的措施（无外部支持的情况下）？

- [ ] 否
- [ ] 是
- [x] 不确定

- 规章制度（罚款）/执行
- 声望、社会压力/社会凝聚
- 加入运动/项目/团体/网络
- 环境意识
- 习俗和信仰，道德
- 提高SLM知识和技能
- 美学改进
- 冲突缓解

结论和吸取的教训

长处: 土地使用者的观点

长处: 编制者或其他关键资源人员的观点

- the effects of successfully deploying these technologies contribute to creating good-quality schemes with few water management problems and moderate production and maintenance costs. (How to sustain/ enhance this strength: there is the matter of how the technologies presented will continue to be applied within a team. To ensure sustainability, appropriate IT capacities and, more specifically, expertise in GIS software packages are necessary. It is important for these capacities to be embedded institutionally, rather than held by certain individuals.)
- Landsat: One important impact/effect was that the consultant on site was able to persuade donors of the feasibility of carrying out minimum-level monitoring despite the difficult security situation. This was crucial as the donors were faced with a difficult choice: on the one hand, the lack of security made it impossible to access the zone in order to carry out monitoring and supervision missions, which seriously threatened the continuity of the programme; on the other hand, donors were obviously very sensitive to the plight of the communities suffering occupation and armed conflict.
- Total stations and GPS: These two technologies allow users to ascertain the specific features of sites more accurately than is possible with 'traditional' approaches, which are more basic and less refined. The technologies enable the design of good-quality schemes by facilitating water management. It is important to highlight the fact that a good-quality irrigation scheme (which is well configured and laid out in terms of its irrigation network and facilities) reduces production costs (less pumping time needed).

弱点/缺点/风险: 土地使用者的观点如何克服

弱点/缺点/风险: 编制者或其他关键资源人员的观点如何克服

- Since 2003, Landsat images have displayed stripes or horizontal bands (running west to east) with no data. This, of course, complicates the analysis of VIS polygons as much of their area falls under these stripes. Indeed, most VIS polygons situated in data-loss stripe areas (such as Diré) fall partially within a data loss area and partially without. It is possible to verify the presence of vegetation for these VISs, but it is not possible to estimate the area of cultivated land. However, we hope that Landsat 8 will provide fault-free images, just as Landsat 7 did from 1999 to 2003.

参考文献

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WOCAT数据库中的完整描述
https://qcat.wocat.net/zh/wocat/approaches/view/approaches_2519/

链接的SLM数据
Technologies: Zoning for the application of irrigation system https://qcat.wocat.net/zh/wocat/technologies/view/technologies_3299/

文件编制者

机构
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (GIZ) - 德国

项目
- Irrigation Projects in the Niger Inland Delta (IPRO-DI)

主要参考文献

- Manual of Good Practices in Small Scale Irrigation in the Sahel. Experiences from Mali. Published by GIZ in 2014.: http://star-www.giz.de/starweb/giz/pub/servlet.starweb
- A range of internal technical guides (GIZ):