

Grassed waterway (Sergiu Magdil)

Integrated Land and Water Management (摩尔多瓦共和国)

Managementul integrat al solului și al apei

描述

Integrated land and water management was promoted in order to improve agricultural production while reducing soil loss and nutrient discharge into water bodies. Technical assistance and financial support was provided for sustainable agricultural practices, including: nutrient management, conservation agriculture, integrated cropping management, agroforestry and wetland management.

Integrated land and water management was promoted in order to improve agricultural production while reducing soil loss and nutrient discharge into water bodies. Technical assistance and financial support was provided for sustainable agricultural practices, including:

1. Manure Management Practices:

Organic manure was substituted for inorganic fertilizer, and eight commune/village stores were constructed together with 1200 household stores and equipment provided for manure handling and field application. A monitoring database was made available.

2. Promotion of Environment-Friendly Agricultural Practices:

A well-documented pilot was completed and evaluated for replication, and 300 farmers then trained in the application of environment-friendly agricultural practices. The capacity of extension staff significantly improved. A monitoring system to determine the impact of practices on soil quality was installed and data collected.

3. Shrub and Tree Planting:

• 132 hectares of shelterbelts for water protection established; 112 hectares of improved anti-erosion forest belts set up; 50 hectares of improved pasture established; 484 hectares of the existing forests rehabilitated and properly managed; forest monitoring was incorporated into the general monitoring scheme.

4. Wetland Restoration and Promotion of Sustainable Management Practices:

The existing ecosystems were rehabilitated and ecologically well balanced. In this context two dams were built with a sluice gate system for the stabilization of water levels; three concrete bridges with adequate culvert capacity were installed for accessibility to different portions of the wetland; and 10 small wood bridges with culverts were built for access.

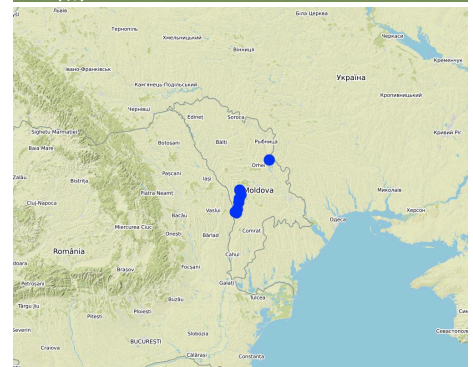
5. Monitoring Soil and Water Quality and Environmental Impacts

Availability of water for downstream users and fisheries was increased, drinking water supplies was improved, there was increased quality and availability of groundwater for human and animal consumption, and simultaneously better productive lands with increased organic matter and carbon sequestration, as well as increased biodiversity.

Key Elements of the Manure Management System:

- Segregation of inert and recyclable materials from livestock waste through the provision of a separate household waste container.
- Improved manure stores for storage of waste at a single impermeable store at the household with enough storage for up to one month's production.
- Transfer of waste from the farm store to a central site, using transport units then unloading it at the commune platform, to aerate the waste, promoting continued bacterial activity.
- At the commune/village store level, the segregated inert materials deposited in designated bunkers.
- At the commune/village store level, management of the household manure at the main bunker involving stacking in shaped windrow heaps three metres high.
- Store the waste deep so that the areas getting wet from rainfall is minimised. Provide impermeable walls and floor to eliminate leaching.
- Provide storage capacity for over the winter so that matured manure will be available for use on the land.

地点



地点: Negrea, Lapusna, Carpineni, Minjir communes, Hincesti district; Sarata Razesti commune, Leova district, and Jora de Mijloc, Orhei district, Hincesti and Orhei districts, 摩尔多瓦共和国

分析的技术场所数量: 2-10个场所

选定地点的地理参考

- 28.36446, 46.9753
- 28.39688, 46.89446
- 28.35912, 46.82966
- 28.34058, 46.76762
- 28.31311, 46.65321
- 28.25509, 46.61407
- 28.29543, 46.59662
- 29.0835, 47.46431

技术传播: 均匀地分布在一个区域 (approx. > 10,000 平方千米)

实施日期:

介绍类型

- 土地使
- 作为传
- 在实
- 期
- 外
- 干
- 创新
- >50 年分

Key Elements of facilities at the Village Platform are:

- a. Concrete area for the management of the manure.
- b. Bunkers for the segregated household manure.
- c. Collecting channel for runoff from the platform.
- d. Storage pits and tanks with impermeable base and walls.
- e. Security fencing.
- f. Office / Staff facilities and Landscaping. Monitoring wells to check for leakages.

Overall results show that 8,250 farmers from both the project pilot area and other regions of Moldova had adopted at least one environmentally-friendly agricultural practice promoted by the project, and had implemented these on 14,028 ha of land.



Crop rotation (Sergiu Magdil)



Manure Storage Platform (Sergiu Magdil)

技术分

主要目的

- 改 产
- 减少、 、恢复土地化
- 保护态
- 合其他技术保护流域下游区域
- 保持/提 生物多样性
- 低灾害
- 应气候变化天气及其影响
- 减 气候变化及其影响
- 创 有 济影响
- 创 有 会影响

土地利用



农田 - 一年一作, 多年一作 木 木与灌木 植
主 农作物 济作物及 Wh 作物 corn, sunflower, alfalfa (lucerne), vineyards, orchards, vegetables



水道、水体、湿地 - 排水 、水沼泽、湿地
主 产品服务: The existing ecosystems rehabilitated and ecologically well balanced; dams with a sluice gate system for the stabilization of water levels; concrete bridges with adequate culvert capacity for access to different portions of the wetland; and wooden bridges with culvert capacity for access through the zone constructed

供水

- 养
- 混合 水灌溉
- 充分灌溉

每年的生长季节数: 1

该技术实施前的土地利用: 不

牲畜密度: 不

土地退化相关的目的

- 止土地化
- 减少土地化
- 修复/恢复严 化 土地
- 应土地化
- 不

解决的退化问题



土壤水蚀 - Wt 土流 侵, Wg 冲沟侵沟, Wm 块体 滑坡, Wr 河岸侵 Wo 场外劣化效应



化学性土壤退化 - Cn 力下 和有机 含 下 , Cp 土壤污染 s 化化



物理性土壤退化 - Pc 压实 k 熟化和, P 有机土壤沉 土壤沉



生物性退化 - Bc 植 , Bh 减 息地丧失 Bq 数 物 减少 Bs 和物 多样性 成 下 BI 土壤寿命损失



水质恶化 - Ha 干旱化 Hp 地 水水, H 地下水水 下 , Hw 湿地 冲 力下

SLM组

- 森林 植 理
- 作制度 作、休 、 垦
- 农 合 理

SLM措施



农艺措施 - A1 植 和土壤, A2 层有机 土壤 力



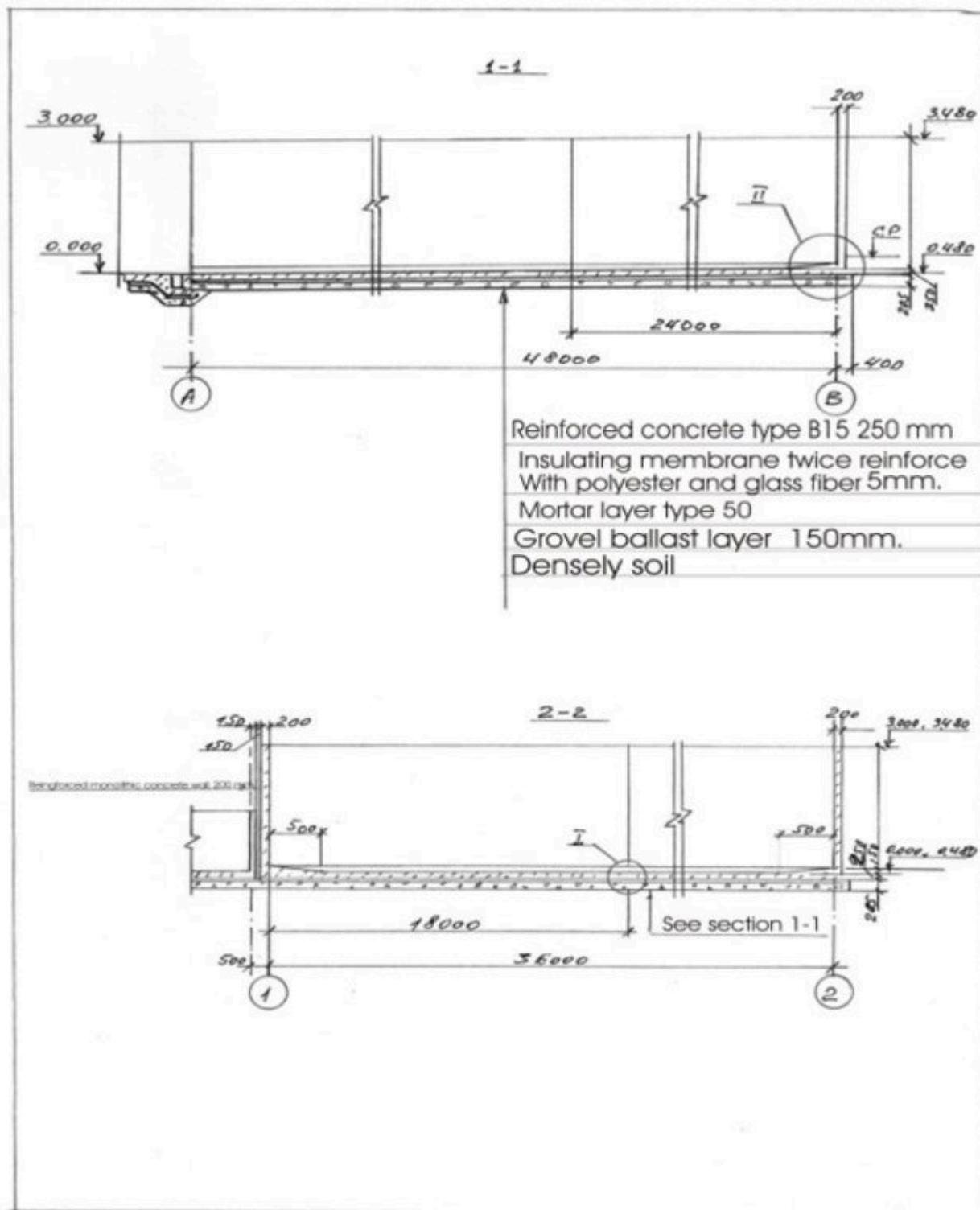
植物措施 - V1 乔木和灌木 V2 层 和多年 , V 本植物 更换或清 外 入侵物



管理措施 - M2 改变 / 强 另 M3 根据 然和人文环境 布局, M5 物 成 变化控制 废物 理 回收、再利 减少

技术图

技术规范



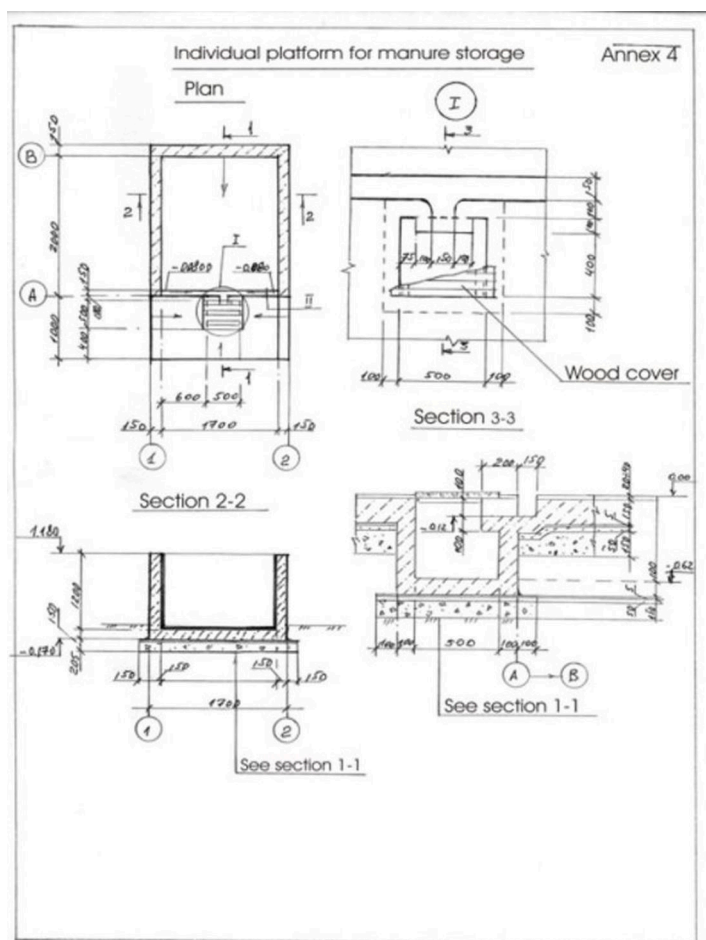
作 Ion Raileanu

Schematic structure of village platform: Length - 48 m, Width - 36 m, Height - 3 m, Capacity - 3400 tons, Storage period - 5 months

Schematic structure of household platform: Length - 2.2 m, Height - 1.2 m, Capacity - 4.8 c.m., Storage period - 1 month.

At village level, the project supported the construction of waste storage platforms of 3400 tonnes capacity and a storage period of 5 months. The platform has 48 m length and 36 m width. It is surrounded by a concrete 3 m high wall and bedded by a concrete floor with an impermeable insulating membrane. The platform is equipped with a bunker for inert material and a basin for collection of liquid fraction. The platform is built on the commune land (administrated by the Mayoralty) in full compliance with the environmental protection requirements.

At the household-level 150 platforms were built. The platforms have 2.55 m³ and a storage period of one month. The platform capacity was calculated based on estimated quantity of manure for an average household with at least two cattle, two-three pigs and a certain number of poultry. The designed platform consists of a simple open fronted store with a concrete floor and 1.5 m height walls. In front of the platform, a concrete below ground tank (125 dcm³ volume) covered by a wood lid with a plastic basket inside of 50 liters capacity for collection of liquid wastes would be equipped. A separate small capacity container (about 90 liters) for the collection of recyclable and non-recyclable household wastes was also provided.



作者: Ion Raileanu

技术建立与保护活动、投入和成本

投入和成本的计算

- 投入和成本为
- 成本为使用不适用币
- 汇率转换为元，元不
- 投入和成本为每日平均工成本不

影响成本的最重要因素

不

技术建立活动

1. Packages developed for manure management at village and household level and evaluated for replication (时 / 率None)
2. Public awareness & education (时 / 率None)
3. Use of good agricultural practices by farmer associations, family farms and individual farmers on cropland. (时 / 率None)
4. Monitoring & evaluation. (时 / 率None)

技术维护活动

n.a.

自然环境

年平均降雨量

- < 250毫米
- 251-500毫米
- 501-750毫米
- 751-1,000毫米
- 1,001-1,500毫米
- 1,501-2,000毫米
- 2,001-3,000毫米
- 3,001-4,000毫米
- > 4,000毫米

农业气候带

- 潮湿
- 半湿润
- 半干旱
- 干旱

关于气候的规范

以毫米为单位，年平均500.0毫米，气候名称Hindesti

Climate is moderately continental: the summers are warm and long with temperatures averaging about 20°C, and the winters are relatively mild and dry, with January temperatures averaging -4°C. Annual rainfall, which ranges from around 500 millimeters; long dry spells are not unusual. The heaviest rainfall occurs in summer; heavy showers and thunderstorms are common.

斜坡

- 水平 0-2%
- 3-5%
- 平 6-10%
- 滚坡 11-15%
- 崎岖 16-30%
- 峭 31-60%
- 常 峭 60%

地形

- 平原
- 山
- 山坡
- 山地斜坡
- 坡
- 底

海拔

- 0-100 m a.s.l.
- 101-500 m a.s.l.
- 501-1,000 m a.s.l.
- 1,001-1,500 m a.s.l.
- 1,501-2,000 m a.s.l.
- 2,001-2,500 m a.s.l.
- 2,501-3,000 m a.s.l.
- 3,001-4,000 m a.s.l.
- > 4,000 m a.s.l.

应用的技术

- 凸形情况
- 凹形情况
- 不关

土壤深度

☐ 常浅0-20厘米 ☐
☐ 浅 21-50厘米 ☐
☐ 中 深度51-80厘米 ☐
☐ 深 81-120厘米 ☐
☐ 常深> 120厘米 ☐

土壤质地（表土）

☐ ☐ ☐ ☐ ☐
☐ 中 ☐ 壤土、☐ 土
☐ ☐ ☐ ☐ 土

土壤质地（地表以下>20厘米）

☐ ☐ ☐ ☐ ☐
☐ 中 ☐ 壤土、☐ 土
☐ ☐ ☐ ☐ 土

表土有机质含量

☐ >3%
☐ 中 1-3%
☐ 低 <1%

地下水

☐ ☐ 上
☐ < 50
☐ 5-50
☐ > 50

地表水的可用性

☐ ☐
☐ 好
☐ 中
☐ 匮乏/没有

水质（未处理）

☐ 好 ☐ 水
☐ 不 ☐ 水 ☐ ☐
☐ 仅供农业使 ☐ 灌溉
☐ 不可

盐度是个问题吗？

☐ 是
☐ 否

洪水发生

☐ 是
☐ 否

物种多样性

☐ ☐
☐ 中
☐ 低

栖息地多样性

☐ ☐
☐ 中
☐ 低

应用 技术 土地使用 特征

市场定位

☐ ☐ ☐ ☐ ☐
☐ 混合 ☐ /商业
☐ 商业/市场

非农收入

☐ 低于全 ☐ 收入 ☐ 0%
☐ 收入 ☐ 10-50%
☐ > 收入 ☐ 50%

相对财富水平

☐ ☐ 常 ☐
☐ ☐
☐ 平均水平
☐ 丰富
☐ 常丰富

机械化水平

☐ 手工作业
☐ ☐ 力牵引
☐ 机械化/☐ 动

定居或游牧

☐ 定居
☐ 半游牧
☐ 游牧

个人或集体

☐ 个人/家庭
☐ 团体/☐ 区
☐ 合作
☐ 员工 ☐ 公司、政府

性别

☐ 女人
☐ ☐ 人

年龄

☐ 儿
☐ ☐ 年人
☐ 中年人
☐ ☐ 年人

每户使用面积

☐ < 0.5 公
☐ 0.5-1 公
☐ 1-2 公
☐ 2-5公
☐ 5-15公
☐ 15-50公
☐ 50-100公
☐ 100-500公
☐ 500-1,000公
☐ 1,000-10,000公
☐ > 10,000公

规模

☐ 小 ☐ 模
☐ 中 ☐ 模
☐ 大 ☐ 模

土地所有权

☐ 州
☐ 公司
☐ 村庄
☐ 团体
☐ 个人 ☐ 未命名
☐ 个人 ☐ 有命名

土地使用权

☐ ☐ ☐ ☐ 入 ☐ 无 ☐
☐ ☐ 区 ☐ 有 ☐
☐ ☐
☐ 个人

用水权

☐ ☐ ☐ ☐ 入 ☐ 无 ☐
☐ ☐ 区 ☐ 有 ☐
☐ ☐
☐ 个人

进入服务和基础设施的通道

健康
教
技术援助
就业 例如 农
市场
源
和交
水和卫 施
服务

☐ ☐ ☒ ☐ ☐ 好
☐ ☐ ☒ ☐ ☐ 好
☐ ☐ ☒ ☐ ☐ 好
☐ ☐ ☒ ☐ ☐ 好
☐ ☐ ☒ ☐ ☐ 好
☐ ☐ ☒ ☐ ☐ 好
☐ ☐ ☒ ☐ ☐ 好
☐ ☐ ☒ ☐ ☐ 好
☐ ☐ ☒ ☐ ☐ 好

影响

社会经济影响

作物 产

☐ 位 ☐ ☐ ☐ ☒ ☐ ☐ 增加

牧 产

木材 产

木材林业 产

产故 低

土地 理

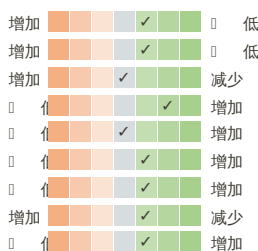
水 水

家 水

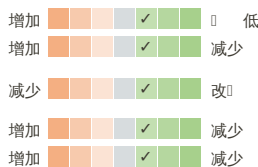
☐ 位 ☐ ☐ ☐ ☒ ☐ ☐ 增加
☐ 位 ☐ ☐ ☐ ☒ ☐ ☐ 增加
☐ 位 ☐ ☐ ☐ ☒ ☐ ☐ 增加
增加 ☐ ☐ ☐ ☒ ☐ ☐ 低
妨 ☐ ☐ ☐ ☒ ☐ ☐ 化
☐ 位 ☐ ☐ ☐ ☒ ☐ ☐ 增加
☐ 位 ☐ ☐ ☐ ☒ ☐ ☐ 增加

According to elevator (NGO BIOS), •The SROI (Social Return on Investment) ratio for the period of 2004-2009 was 3,34, or, every \$US1 invested by the Project \$US 3,34 worth of value (economic, social and/or environmental) was delivered to society.

栖息地多样性



对公共/人基/施/坏



常消耗 常消耗

<input type="checkbox"/>	常消耗					<input checked="" type="checkbox"/>				<input type="checkbox"/>	常	极
<input type="checkbox"/>	常消耗							<input checked="" type="checkbox"/>		<input type="checkbox"/>	常	极

—

8,250 farmers from both project pilot area and other regions of Moldova

劳动力可性例如 于

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

编制者

Valentin Ciubotaru

Editors

Valentin Ciubotaru
UNCCD PRAIS

审查者

Farrukh Nazarmavloev
William Critchley
Rima Mekdaschi Studer

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资源人

Valentin Ciubotaru (valentin.ciubotaru@yahoo.com) - SLM专业人员

WOCAT数据库中的完整描述

https://qcat.wocat.net/zh/wocat/technologies/view/technologies_1817/

链接的SLM数据

不

文件编制者

机构

- NGO BIOS (.) - 摩尔多瓦共和国

不

- 不

主要参考文献

- Guidelines for Good Agricultural Practices (Practici agricole prietenoase mediului). Îndrumar: /Ungureanu V., Cerbari V., Magdîl A., Gherman E.- Chişinău: Tipografia Centrală, 2006. – 96 p.: <http://www.acsa.md/album.php?l=ro&idc=152&t=/GALERIE-FOTO/Practici-agricole-prietenose-mediului>

链接到网络上可用的相关信息

- Moldova - Agricultural Pollution Control Project (English): <http://documents.worldbank.org/curated/en/117701468287732017/Moldova-Agricultural-Pollution-Control-Project>

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