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NORTH CAMEROON

LIVESTOCK AND AGRICULTURAL DEVELOPMENT

PROJECT 631-0004

ANNUAL REPORT 1984

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Water Point #11

W.P. #11 accumulated 6,500 cubic meters of water this season from 2.5% of 469 millimeters of rain. The 2.5% runoff cannot be considered exact, but it is the same figure that was recorded last year. The low runoff--5% was the factored figure used in the design--may be due to the flat catchment area (slope is no greater than 0.5%), the high amount of shrub and tree cover (about 80%), the high infiltration through the sandy loam topsoil and, perhaps most important, the low intensity of the storms and high time lag between them. The actual runoff was assumed to

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be 20% and these factors were assumed to be taken care of when the minimum required catchment area was quadrupled to determine the design catchment area. The catchment area was enlarged from 40 to 80 hectares near the end of the rainy season. A normal's year rainfall of 800 millimeters should fill the pond.

This pond was built to allow livestock direct access to the water, but during last dry season the water became polluted and unfit to drink. Therefore, a simple pumping system was installed and the pond was fenced in. Unfortunately, there is no technical literature available locally for the pumps and so the Project does not know that the pump will be able to lift water from the bottom of the pond. The pump can supply one liter of water per second, which--at the rate of 40 liters per stock unit per day--is enough for the design load of 1,100 stock units if the pump is worked 12 hours a day. A 12-hour pump day is unrealistic, as is assuming a supply of 40 liters per stock unit, therefor, it is projected that the pond will supply water through March.

No cattle troughs have been built for the pond. The Project Administration has decided that the users will be required to build them out of clay. This is an excellent idea for three reasons: First, it requires the active participation of the people actually using the pond. Second, the construction of clay cattle troughs is already practiced locally. And third, the high cost of constructing and maintaining waterproofed, concrete cattle troughs will not be required.

Other work done at W.P. #11 includes: excavating two sedimentation tanks upstream of the baffled apron drop; an evaporation test that showed that evaporation is 50% greater

at the top of the pond than at the bottom; and the construction of three observation wells.

Water Point #12

W.P. #12 accumulated 6,000 cubic meters of water this season from 25% of the 200 millimeters of rain that fell on the 12-hectare catchment area. The 25% runoff is very close to the assumed runoff of 20% and seems to be due to the fact that the slope of the small catchment area is only about 0.5%, the infiltration rate of the runoff through the topsoil is very low due to the high percentage of clay.

This water point, completed in May, has a pumping system similar to the one at W.P. #11, but the depth here is not so great as at the first pond, therefore, there should be no problems encountered as the water level decreases.

The construction of clay cattle troughs is to be the same here as at W.P. #11.

Water Point #33

W.P. #33 was designed to supply 200 animal units 40 liters of water per day for eight months. Construction began in May--after a stop-work order was lifted by USAID/Yaounde--but stopped in July at a depth of 3.5 meters when the heavy equipment was sent to Block #1 to do soil conservation work. The design depth is to be exceeded by 0.5 meters so that a 0.5-meter lining can be placed over the soft, porous rock found at that depth. The soil for the lining may be cut from the slopes.

The design of this pond is different from the first two for two reasons: First of all, the berms are being built much closer to the pond and higher; they are also completely enclosing the pond on three sides and three corners. This design should not only reduce evaporation loss due to the wind relative to the first two ponds, it should also reduce livestock traffic and therefore erosion

immediately around the pond. The second design change replaces the concrete baffled apron drop with a gabion structure that will be both the inlet and outlet for the water. Coming in, the water will drop down the well into the pond; coming out, it will be withdrawn with a rope and bucket. This is one reason for making the pond as shallow as possible: the deeper the pond, the more labor will be required to draw water as the hot dry season progresses. (It will be interesting to see if the herders actually draw or pump enough water for the herds.)

The construction of the remaining part of the pond is not due to begin until after work is completed in Block #2.

Soil Conservation Scheme #11

S.C.S. #11 was the scene of several soil conservation activities, most of which were based on the recommendations of Dr. Ron Gaddis, soil and water conservation engineer, who visited the Project at the Project's request.

Dr. Gaddis' three major recommendations for the area were implemented and worked very well: contour ripping, artificial reseeding and scoop holes.

Nine rock weirs were also built. Their original purpose was to determine if they would fill in with soil brought by runoff, thereby leveling the stream bed, reducing stream velocity and erosion. Although the weirs did not become impermeable this season they did dam up the water long enough for the transported sand to settle out, filling the upstream side of the weir with sand, but no clay or silt. As runoff decreased, the silt and clay in the water had time to settle out until a very low discharge forced its way through the rocks carrying much of the stored soil with it. The weir crests were about one meter above the original stream bed and sometimes had almost that much sand trapped behind them until the low flow carried much of it away.

Therefore, with this experience plus another of Dr. Gaddis' recommendations--based on a visit to a mayo in the Project area where a rock barrier dams enough water for the local livestock for the entire dry season--it was decided to build a small concrete drop structure about ten meters long and one-and-one-half meters high at the most successful of the nine weir sites.* The 300,000 CFA structure is designed to retain 200 to 400 cubic meters of sand holding 80 to 160 cubic meters of water, which can supply 12 to 25 stock units with 40 liters of water a day from November through March. If the idea works it can be expanded. Gabion structures with clay cores can be built to retain water-bearing sand in the mayos. Such a series of structures would not only conserve water they would greatly reduce bank erosion in the mayos. During the dry seasons shallow wells could be dug to draw water in a manner similar to that already practiced in the area.

Soil Conservation Scheme #12

S.C.S. #12 consists of 50 scoop holes dug near the end of the rainy season. The holes were based on a successful trial at S.C.S. #11, where the holes--dug by the grader--reduced runoff, stored water and encouraged growth in the immediate area.

Project Center Construction

Five buildings have been or are being constructed at the Project Center:

1. Office Annex (complete)
2. Case de Passage (under construction)
3. Magasin (complete)
4. Villa (under construction)
5. Heavy Equipment Garage (under construction)

The first four buildings are being constructed through

*This is provided for in the Project Implementation Plan Summary Part IB1f(5).

outside contractors; the Project is building the last.

Although the contractors all have the same specifications to work from the quality of construction varied greatly. For example, in order to increase workability the contractors for the office annex and magasin used more water in their concrete work than the specifications allowed; their foundations will therefore be weaker than they were designed to be. (The Project has no power to reject work.) At the same time, the contractor building the case de apssage and villa used a vibrator in his concrete work, which allowed him workability within the water content limit; his foundations will be as designed. (One contractor's propensity to use too much water without making other adjustments in the mix showed when he had to replace a severely cracked floor in one of the offices before the building had been occupied.)

Two recommendations for any future Project construction: First, require all foundation concrete work to be vibrated. And second, require all wood framing members to be treated against termites.

The construction of the heavy equipment garage is proceeding according to specifications.

N.B. The trusses in the magasin should be inspected regularly. They were not engineered for this particular job and show signs of buckling.

RAINFALL DATA
(In millimeters)

Month	Average	Mindif 1983	Mindif 1984	W.P. #11 1983	W.P. #11 1984	S.C.S. #11 1983	S.C.S. #11 1984
January	0	0	0	--	0	--	0
February	0	0	0	--	0	--	0
March	0	0	6	--	0	--	0
April	38	0	17	--	7	--	12
May	27	7	80	--	80	--	83
June	45	97	42	--	47	--	44
July	313	160	167	*	170	--	139
August	247	160	152	144	63	**	43
September	91	71	125	59	75	51	78
October	52	0	12	0	27	0	32
November	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0
	813	495	601	(?)	469	(?)	431

*Installed July 27, 1983
**Installed August 17, 1983