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TAGMI Glossary

Agricultural water management (AWM): "AWM is the activity of planning, developing, distributing and managing the optimum use of water resources for agricultural purposes, through a suite of strategies" (Douxchamps et al 2012, p1)

AWM Technology: an agricultural water management technology changes the partitioning of water when reaching the soil surface, and can be *in-situ* (including most soil and water conservation technologies) or *ex-situ* (including small reservoirs and small scale irrigation). The source of water for AWM technologies can be rainwater harvesting, groundwater, relocated stream flow or recycled water. (Barron et al 2009, p2)

Soil and water conservation (SWC) strategies: SWC strategies are *in-situ* interventions, at the micro-catchment scale, that aim to enhance water infiltration, improve soil water storage, and reducing soil erosion. They can achieve this by capturing and slowing surface runoff with physical barriers, or by improving the soil structure and fertility. Strategies include contour bunds (earth or stone), tied ridges, terracing, conservation tillage, mulching, composting, planting pits or *zai*, half-moons, live hedging and crop management (e.g. intercropping). (Douxchamps et al 2012; Barron et al 2009) SWC strategies are typically individual, but labour-intensive options such as terracing or stone bunds may be more easily implemented with community effort.

Conservation agriculture (CA): CA is a soil and water conservation strategy with three key tenets: no tillage, permanent soil cover (e.g. using crop residues) and crop diversification using rotation and/or intercropping.

Small reservoirs: Small reservoirs are *ex-situ* structures of earth, stone or concrete, that capture and store run-off at the macro-catchment level, and range in surface area from 3 to 30 ha (Douxchamps et al 2012), dam walls up to 8m high, and storage volume up to 1 million m3 (Senzanje et al 2008). They have multiple uses: supplementary irrigation during dry spells, dry season irrigation, fishing, livestock and household watering, and groundwater recharge through decreasing run-off. In contrast to the individually-managed *in-situ* AWM strategies, small reservoirs benefit the whole community and therefore require a strong management structure usually in the form of farmers' or village organizations to be in place in order to be effective. Communal efforts and management are necessary for construction, maintenance and water allocation (Douxchamps et al 2012). "Small reservoirs are classified into two sub-groups namely, small dams and dugouts, according to their size, priority of water use, structural details and their management system (Namara et al., 2010). Small dams are barriers that impound permanent or temporary rivers. Depending on the topography of the watershed, small dams will be placed in the gully to retain run-off downstream. They can be made of concrete, rocks or earth, with or without spillway, permeable or not, depending on the purpose of the dam. Dugouts (or "bouli" in Burkina Faso) are artificial pools of about 3-4 m depth and 50-60 m diameter at the foot or midway up a slope where there is convergence of run-off (Barry et al., 2006). They are smaller than small dams, in terms of surface area, volume of water they impound and number of beneficiaries, and have no intake structures, canals and laterals (Namara et al., 2010). The removed soil is used to build an enclosure wall that is left open on the uphill side of the pool. The water collected can last for 2-3 months after the rains and is mainly used for livestock watering and to irrigate small market garden crops (Barry et al., 2006). Ponds are natural structures with the same functions as dugouts." (Douxchamps et al 2012, p11)

Small scale irrigation: "Irrigation implies the transport of the water from the reservoir to the crop, which is done either by hand from a nearby well, by means of gravity through tunnels, pipes or open channels fitted with control valves (Ofosu et al., 2010), or by mechanized irrigation systems involving pumps." (Douxchamps et al 2012, p11) Small-scale irrigation can be individual (e.g. family drip irrigation packs, South Africa, Senzanje et al 2012) or communal (e.g. village schemes connected to a small reservoir, or sand-water abstraction,

Drip irrigation: a form of small-scale irrigation using pipes punched with holes, which are laid out along the crop lines, allowing watering in controlled amounts, directed to the base of the plant. This conserves water, by reducing the overall amount used and by reducing evaporation. The system can be gravity-fed using hand-collected water funnelled into the pipe system, or mechanised and attached to a pump that draws water from a nearby water source.

Likelihood of success: Low - Medium - High This is the end result of the model calculation, and indicates the likelihood that an AWM project implemented in that district will be successful. The result is formed by the interaction of varying levels of the important influencing factors (e.g. rainfall, land, labour, infrastructure or skills). For example, if all important factors are present at high levels, the likelihood of success will be High. If all important factors are low the likelihood of success will be low. If some are high and some are low, then the result depends on how relatively influential each factor is, and how they interact with each other; this is where the need for the model becomes apparent.

Strength of evidence: Strong - Moderate - Weak This reflects the quality of the data underlying the result - referring to the fact that a model's predictions are only as good as the data that goes into. For example, if the data is recent, consistently representative across the country, and is available at district level, for all factors in the model, the evidence base for the result is strong. However, if data is old, or only available for a few points in the country, or only at national level, or only available for a few of the factors in the model, the evidence base for the result is weak.

Factor [of success]: The web-tool's Bayesian Model is driven by a group of **Factors** of Success, or a circumstance, fact, or influence that contributes to the successful implementation, adoption and out-scaling of an AWM technology. Factors affecting success are both those related to the "**Context**" (outside of the implementer's control) and those related to "**Best Practice**" (inside the implementor's control). The model currently only includes "Context" Factors.

Indicator: used to convey the presence of a given factor. It conveys the state or level of a factor, and in this case they act as proxy variables to convey the presence of given factor of success. Indicators have a number, or quantity that increases or decreases over time the data supporting each Indicator has been documented to provide a sense of the representativeness of the maps displayed.

A **Context Factor** is a characteristic of a project site that was present before the project started and is outside the control of the project (e.g. biophysical characteristics - rainfall, institutional characteristics - government policies, socio-economic characteristics - income, skills, health). The model further groups **Context Factors** into five categories of 'assets' of 'capitals' using the Sustainable Livelihoods Framework (DFID, 1999; Scoones, 1998). **Social capital** is the set of networks and relationships that support coordinated strategies for achieving livelihood goals. **Human capital** is individual skills and knowledge, as well as health and physical ability, that can be mobilized in livelihood strategies. **Physical capital** is the infrastructure, equipment, and other long-lived physical goods that people, households, and communities can bring into use. **Financial capital** is the pool of economic assets, including savings, cash or other liquid assets, and credit. Finally, **natural capital** is the natural resource stocks and services that can be used to support livelihood outcomes, including soil, water, genetic variability, and pollution sinks." (Kemp-Benedict et al. 2010).

Best Practice Factors also affect the likelihood that a technology will be successful, but are related to decisions made by the implementer through the design of the project and process of implementation (e.g. level of engagement with the community, prior relationship with the community leaders). These decisions can also affect the Context Factors e.g. capacity building can improve socio-economic and institutional factors; the strategy of implementation, targeting and participation of beneficiaries can affect *who* benefits, and therefore have mixed effects on the context. Best Practice characteristics can affect the context during and after the running time of the project; indeed, often the aim of the project is to positively affect the background context. How well the project is designed, planned and implemented dictates how much the background context is affected, and whether the effect is positive or negative.

References

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