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Use of medium-range weather forecasts for drought mitigation and adaptation under a Mediterranean area

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The main pillar of economic development in Morocco is the agricultural sector employing 40% of the active workforce. Agriculture is still mainly dominated by rainfed agriculture which is vulnerable to an increasing frequency and severity of drought events. In rainfed agriculture, there are few interventions possible once crops are planted. Medium to long range weather forecasts could therefore provide valid information for crop selection and sowing time at the onset of the yield season and later to plan mitigation measures during dry-spell episodes. More than 600 daily forecasts from the European Centre for Medium-Range Weather Forecasts (ECMWF) ensemble forecasting system were analyzed in terms of probabilistic skills scores. Results show that, while daily and weekly accumulated precipitation are poorly predicted there is good skill in the forecast of occurrence and extent of dry periods. The availability of this information to decision makers in the agricultural sector would mean moving from a reactive drought management plan to a proactive one. This is very important, especially for the remote areas where often the needed help comes late. A simulation case-study involving farmers who were made aware of the availability of forecasts for the next seasons, show that medium-range forecasts will allow i) governments and relief agencies to position themselves for more effective and cost-efficient drought interventions, ii) producers to be more aware of their production options and insure their payment rate, iii) Herders, to cope with higher food costs for their cattle iv) farmers to better plan the pre-season agronomic corrections, to schedule the most appropriate timing for the unique complementary irrigation that they can provide to cereals, and to better schedule the harvesting date. Since failing on these mitigation actions due to a lack of forecast availability would be highly priced for the rural Marocco economy, we stress that forecasting drought onset, especially under the high variability of the Mediterranean climate, is of a paramount importance.