Acted Iraq
Piloting azolla as an alternative feed

Figure 1 – The azolla system as installed by Acted Iraq

In an effort to support sustainable livelihood opportunities while providing innovative solutions to agribusinesses affected by climate change, Acted in Iraq piloted the cultivation of azolla as a supplementary climate-smart feed for chickens under a project funded by CDCS. Azolla kits were distributed to 30 farmers alongside chickens. Acted's Monitoring, Evaluation, Accountability and Learning Unit gathered evidence to assess the economic and environmental gains from utilizing azolla as supplementary chicken feed in Iraq, through diary monitoring filled by 15 farmers willing to record their experience, as well as a Post-Distribution and Endline assessment conducted with all 30 farmers.

Production and impact

As recorded on farmers' diaries, production quality was recorded as very good (31%) or good (51%) on most harvest days. On average, farmers could harvest 1 kg of azolla per day, for **a total estimated production of 90 kgs over three months.** All farmers reported adding fertilizers, as instructed, and supplying on average around 7 liters of water every 14 days, i.e. **45 liters over three months**, to the 25 square metres azolla pond, corresponding to the expected amount of water needed.
It is estimated that between 500 and 4,000 liters of water are required to produce 1 kg wheat[1], the most popular source of chicken feed amongst farmers, meaning that azolla would support a **99.9% decrease in water usage**.

On average, the azolla covered **50% of the farmers' chicken feed needs**. Other feed sources included (in order of frequency of mention) wheat, leftover food, bread, barley. All of the farmers reported saving on chicken feed, with an **average expense decrease of 46%**. With an average cost of 1 USD/kg spent on conventional feed, cost recovery for the azolla system at current production rates would take around 23 months. However, it can be expected that greater returns could be achieved as the systems are scaled up.

While only 2 farmers reported concerns on the nutritional value of azolla (see challenge section in next page), most farmers noted increases in eggs production and weight of their chickens resulting from feeding them azolla, as confirmed by literature[2].

Key numbers & facts

30 farmers piloting azolla, **60%** of whom are **women**

100% satisfied on the training on azolla cultivation

130 harvest days documented

0.5 l water /kg azolla, i.e. 99% decrease vs traditional feed

2 kgs azolla harvested every other day

1 kg azolla serve as supplementary feed for **12** chickens

46% decrease in expenditures on chicken feed

[1] "How much water is needed to produce food and how much do we waste?", The Guardian, data retrieved from Institution of Mechanical Engineers
[2] Soren, Kumar (2020), Efficacy of Azolla pinnata as an adjunct to increase poultry weight, egg production and egg weight, Journal of Entomology and Zoology Studies 2020; SP-8(2): 42-45
A. Alalade, A. Iyayi, O. Alalade (2007), The Nutritive Value of Azolla (Azolla pinnata) Meal in Diets for Growing Pullets and Subsequent Effect on Laying Performance, The Journal of Poultry Science, 2007, 44,3, 273-277

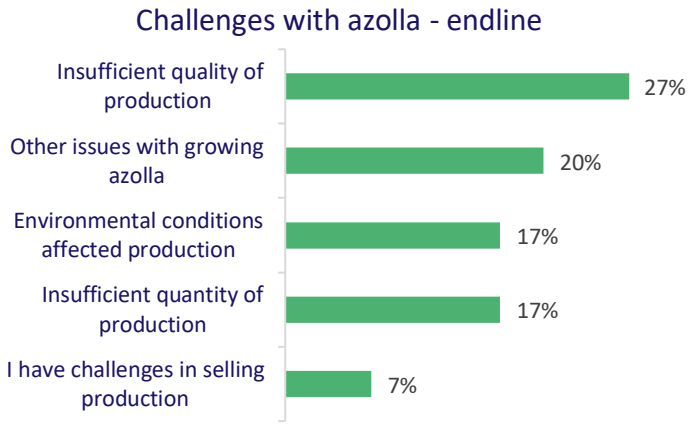
Challenges

Lack of awareness: At the beginning of the project, the project team conducted awareness raising with farmers, most of whom did not know about azolla and were reluctant to start cultivation.

Over-reliance on azolla as a fodder: While the Azolla kits provided were only supposed to serve as supplementary feed, some farmers began to rely on only on azolla to feed their chickens, and thus reported the quantities produced insufficient to cover all feed needs. Eventually, only a few farmers expressed uncertainty about the nutritional adequacy of azolla and ability to produce sufficient quantities.

Inadequate cultivation and harvesting practices Slow growth was reported by most farmers in their diaries (86%) – normally it takes 10 to a maximum of 14 days to start production – while a few (14%) reported water drying out too fast.

When bad quality production was reported, Acted's project team observed that these were mostly due to inadequate practices, such as adding too much/little water, too much fertilizers, covering the pond with plastic sheets causing temperature to be too high. In addition, some farmers harvested the entirety of azolla, without leaving some plants for reproduction in the pond. Acted resupplied such farmers with azolla to restart production.



***40%** of the farmers do not face any challenges growing azolla at endline*

At endline, while 40% of farmers do not face any challenges growing azolla, some remaining challenges are reported, as illustrated in the graph above.

Considerations on impact and sustainability

At the end of the project, 24 of the 30 farmers were still producing azolla with the kits received. Those who were not, as per project teams' reports, either harvested all the azolla or had issues with growing it due to inadequate cultivation practices as mentioned above. At project end, **93% of farmers reported improvements in their farms**.

At the end of the project, **90% of the farmers plan to use the azolla for use with their own chickens**, contributing to household food security. 43% also stated that they planned to sell some Azolla to generate additional income. At the same time, around half of the farmers said that they currently **sell their eggs earning some income**. While only one sells all of the eggs produced, most remaining farmers report selling around **half or most of the production**.